

<p>NOTE: This portion of the document should not appear on produced Labels or IFUs.</p> <p>Stryker Instruments (269) 323-7700 (800) 253-3210</p>	<b><u>Dimensions:</u></b>	<b><u>Color/Material/Finish:</u></b>	<b><u>Label Stock:</u></b>	
	8.5 inch (width) x 11 inch Booklet	Color Graphics on White Background 20# Bond or Equivalent	N/A	
	<b><u>Print Location:</u></b>	<b><u>Suppliers/Services:</u></b>	<b><u>Description/Type:</u></b>	
	Print Center	N/A	<b><u>Part Number:</u></b>	<b><u>Rev.</u></b>
			0702-002-700	S



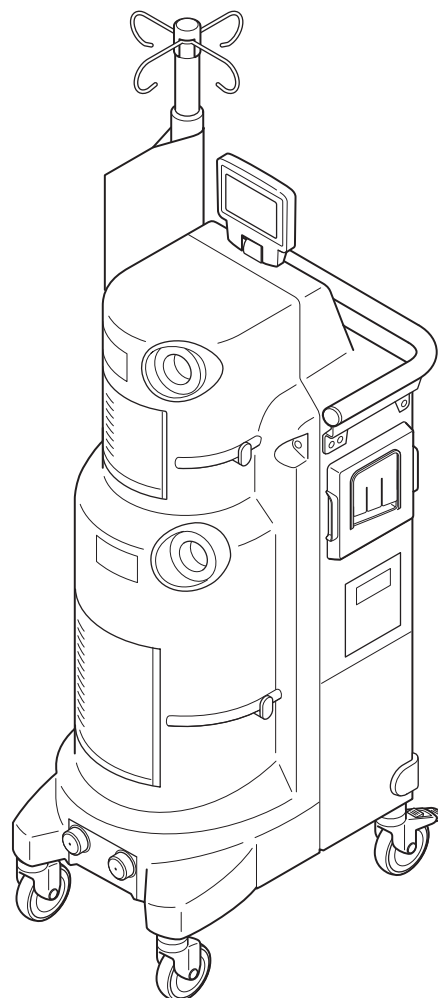
# Neptune<sup>®</sup> 2 Waste Management System

120 VAC ULTRA Rover

REF 0702-001-000

Instructions For Use

**R<sub>x</sub> ONLY**



Software Version

**4.1.x**

ENGLISH (EN)



# WARNING:

## HIGH SUCTION DEVICE

Only trained and experienced healthcare professionals may use this equipment.



DO NOT connect directly to chest tubes.



ALWAYS use the minimum suction limit setting required to achieve the desired clinical outcome.



DO NOT connect to closed wound drains.



NOT FOR USE as a suction source for organ stabilizer/positioner or patient positioner devices.



DO NOT connect directly to tracheal tubes.



NOT FOR USE as a suction source for intermittent suction applications.

## FAILURE TO COMPLY COULD RESULT IN SERIOUS INJURY OR DEATH.

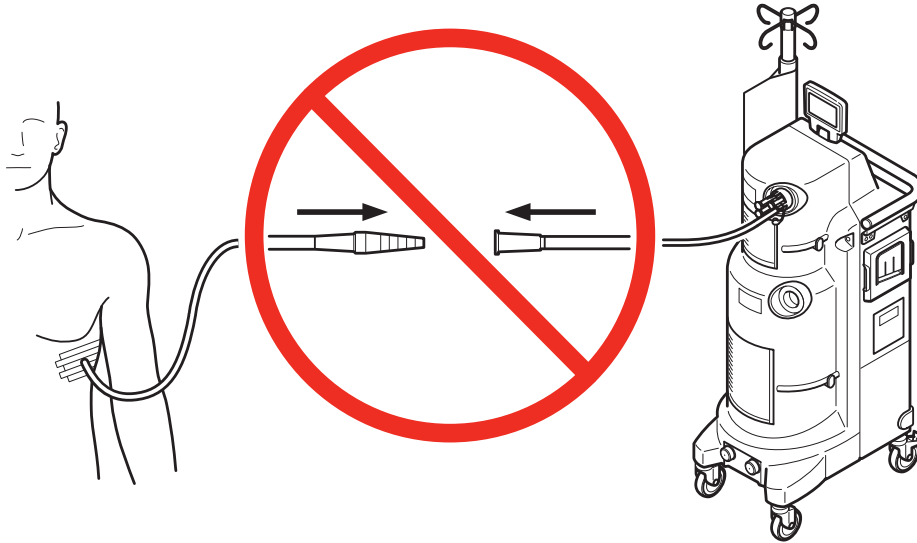
DO NOT remove any safety card from the equipment.

For more information, including safety information, or in-service training, contact your Stryker sales representative or call Neptune Customer Service at **1-800-550-7836**.

# Known Use Errors

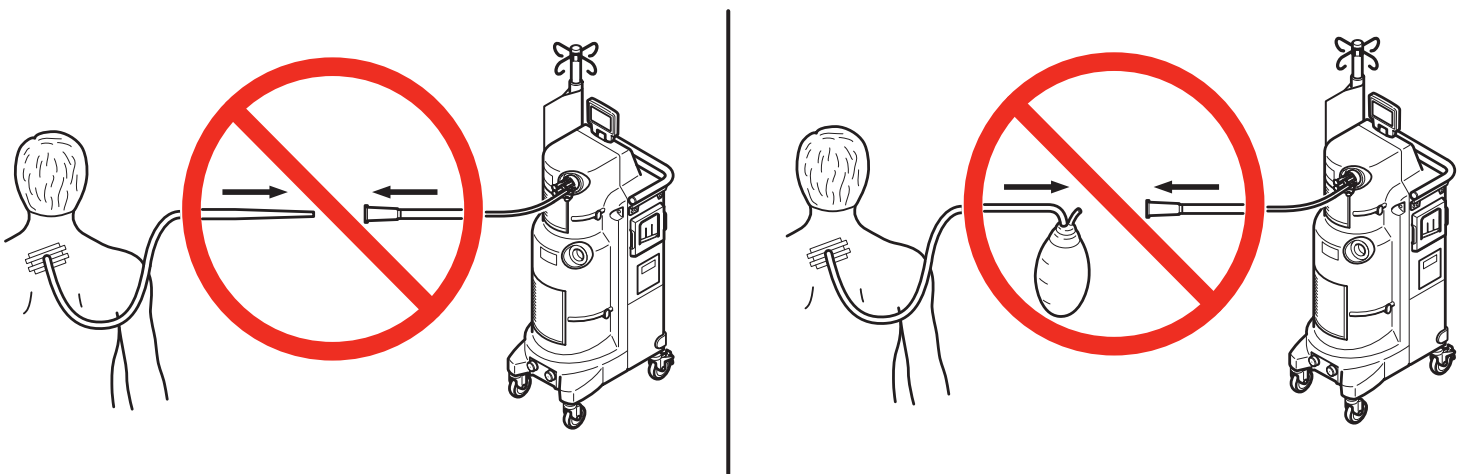
It is important to acknowledge and be aware of potential hazards associated with the Neptune 2 Waste Management System prior to use. This information highlights known use errors that constitute improper and unsafe use of the Neptune 2 system. Stryker has received incident reports of serious injury and/or death associated with operating the Neptune 2 Rover.

Stryker has received reports that the Neptune 2 Rover had been connected directly to a chest tube, postoperatively, which resulted in fatalities.



**Direct connection to chest tube that led to patient death.**

Stryker has received reports that the Neptune 2 Rover had been connected to a patient's closed wound drain, postoperatively, which resulted in serious patient injury.



**Connection to closed wound drain that led to serious patient injury.**

**For training information, visit [www.neptunecustomercare.com](http://www.neptunecustomercare.com).**

# Contents

Introduction .....	6
Conventions .....	6
Contact Information .....	6
Indications For Use .....	6
Contraindications .....	6
For Use With .....	6
Accessories .....	6
System Overview .....	7
User/Patient Safety .....	8
General .....	8
Low Suction .....	8
High Suction .....	8
Electrical Safety .....	8
Environmental/Biological .....	9
Features .....	10
Rover Front View .....	10
Rover Back View .....	11
Control Panel .....	12
Control Panel Display Screens .....	13
Definitions .....	14
Control Panel Button Screen Icons .....	14
Symbols .....	14
Suction Limit Setting Dial Colors .....	15
Fluid Level Display Screen Messages .....	15
Audible Event Indicators .....	15
Instructions .....	16
Before First Use .....	16
To Unpack the Rover .....	16
To Initially Dock the Rover .....	16
To Test the Rover .....	16
1. To Connect Power .....	16
2. To Test Fluid Suction .....	16
3. To Test the IV Pole .....	16
4. To Test Smoke Evacuation .....	17
To Adjust the Rover Settings .....	17
Before the Procedure .....	18
To Setup the Rover .....	18
1. To Connect Power .....	18
2. To Prepare For Fluid Suction .....	19
3. To Prepare For Smoke Evacuation .....	20
4. To Use the IV Pole .....	20
During the Procedure .....	20
To Operate the Rover .....	20
1. To Control Fluid Suction .....	21
2. To Control Smoke Evacuation .....	21
3. To Adjust the IV Pole .....	22
4. To Manage Full Canisters .....	22

After the Procedure .....	23
To Shutdown the Rover.....	23
1. To Remove Fluid Suction Components.....	23
2. To Remove Smoke Evacuation Components .....	24
3. To Remove IV Pole Components .....	24
4. To Remove Power.....	25
5. To Prepare for Relocation .....	25
6. To Relocate the Rover.....	25
To Dock the Rover .....	26
1. To Prepare the Docker.....	26
2. To Perform a Wash Cycle .....	26
Inspection and Maintenance .....	28
Cleaning .....	29
Storage and Handling .....	29
Disposal/Recycle .....	29
Troubleshooting.....	30
Rover Operation .....	30
Docking Station Operation.....	32
Error Code Messages.....	33
Specifications .....	34
Appendix .....	39
To Use Auxiliary Suction Ports (optional).....	39

## Introduction

This *Instructions For Use* manual is the most comprehensive source of information for your product. Keep and consult this reference manual during the life of the product.

## Conventions

The following conventions are used in this manual:

<b>WARNING</b>	A warning highlights a safety-related issue. ALWAYS comply with this information to prevent patient or healthcare staff injury.
<b>CAUTION</b>	A caution highlights a product reliability issue. ALWAYS comply with this information to prevent product damage.
<b>NOTE</b>	A note supplements and/or clarifies procedural information.

## Contact Information

For additional information, including safety information, or in-service training, contact your Stryker sales representative or call Stryker Neptune Customer Service at 1-800-550-7836. Outside the US, contact your nearest Stryker subsidiary.

## Indications For Use

The Neptune 2 Waste Management System is intended to be used in the operating room, pathology, surgical centers, and doctor's offices to collect and dispose of surgical fluid waste as well as collect smoke generated from electrocautery or laser devices.

## Contraindications

The Neptune 2 Waste Management System is **contraindicated against**:

- Connection directly to **chest tubes**.
- Connection to **closed wound drainage systems**.

## For Use With

The following components are required to be used with the equipment described in this manual to create a complete system:

DESCRIPTION	REF
Neptune Docking Detergent (2/pack)	0700-001-026
Neptune 2 Docking Station (docking)	0702-014-000 (120 VAC)
Neptune 2 Manifold(s)	See <i>Accessories</i> section.
Fluid Suction HEPA Filter (1 each)	0702-034-000
Smoke Evacuator ULPA Filter (4/pack)	0702-040-000

**NOTE:** Suction tubing and other accessories are also required for a complete system. These components may not be sold by Stryker. See the *Contact Information* section for more information.

## Accessories

This section describes system components that may be ordered to replace original equipment that is damaged, worn, or must be replaced. This section may also contain optional components used with the system.

The following Stryker-approved accessories are sold separately:

DESCRIPTION	REF
Neptune Docking Detergent (2/pack)	0700-001-026
Neptune 2 4-Port Manifold (20/pack)	0702-020-000
Neptune 2 Specimen Collection 4-Port Manifold (20/pack)	0702-020-001
Neptune 2 Single-Port Manifold (20/pack)	0702-025-000
Fluid Suction HEPA Filter (1 each)	0702-034-000
Smoke Evacuator ULPA Filter (4/pack)	0702-040-000
Smoke (Evacuator) Tubing, 3/8 inch x 10 feet (10/pack)	0702-045-023
Smoke (Evacuator) Tubing, 7/8 inch x 10 feet (10/pack)	0700-026-000
Domestic Power Cord	6000-115-160

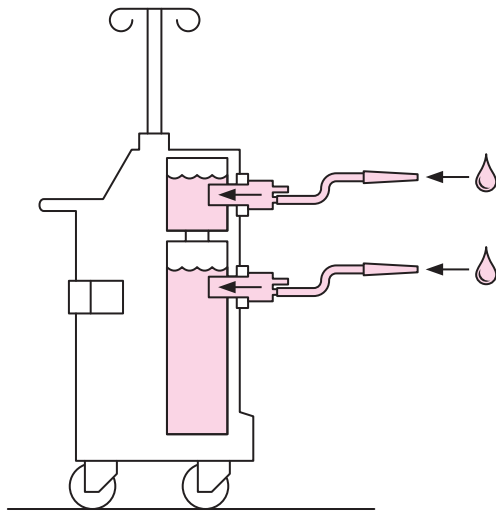
**NOTE:** For a complete list of accessory information, contact your Stryker sales representative or call Stryker Neptune Customer Service. See the *Contact Information* section. Outside the US, contact your nearest Stryker subsidiary.

Trademarks not the property of Stryker Corporation are the property of their respective owners.

## System Overview

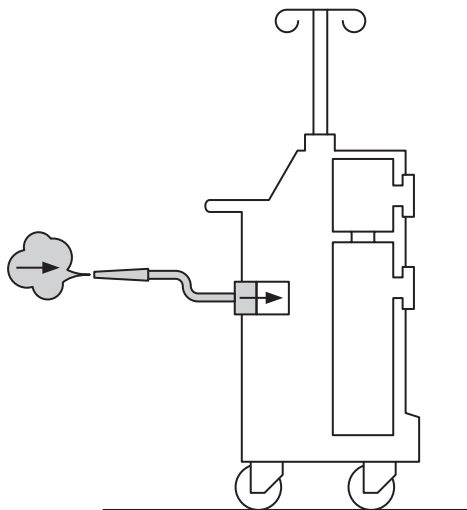
The Stryker Rover (rover) is a mobile unit used to suction and collect fluid waste and evacuate surgical smoke from a surgical site in an operating room. The rover also has a height-adjustable, powered IV pole.

During collection, fluid waste is removed from the surgical site through suction tubing connected to inlet ports of manifold(s) installed in the rover. The fluid waste is collected in the canister(s) of the rover (Figure 1). The two canister design allows separate suction limit settings and fluid volume measurement capability. However, both canisters use a single vacuum pump. The vacuum pump exhaust is filtered.



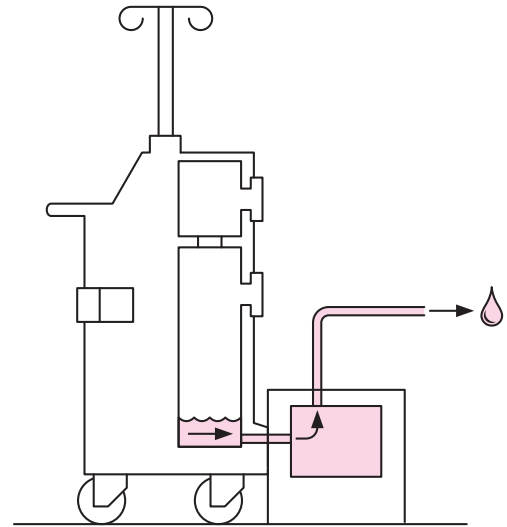
**Figure 1 To Collect Fluid Waste**

Surgical smoke may also be evacuated from the surgical site through smoke tubing connected to the smoke evacuator filter installed in the rover. The surgical smoke is filtered inside the rover (Figure 2).



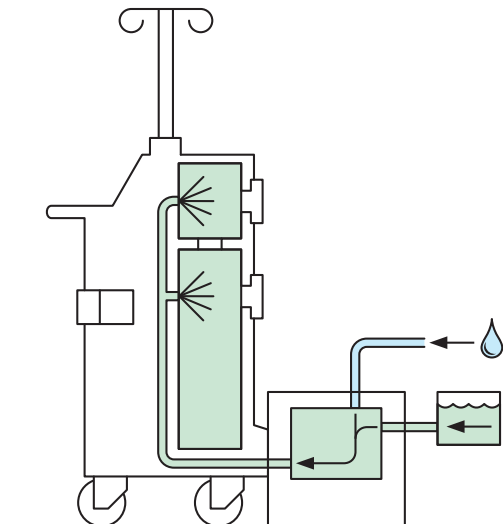
**Figure 2 To Evacuate Surgical Smoke**

After collection, the rover is relocated and mated to the Stryker Docking Station (docked). Once the rover is connected to the docker, the emptying of the fluid waste and cleaning of the canisters occurs automatically (Figure 3).



**Figure 3 To Empty the Canisters**

The rover canister(s) are rinsed with clean water and Neptune Docking Detergent REF 0700-001-026 to clean the canisters of any residual fluid waste (Figure 4).



**Figure 4 To Clean the Canisters**



# User/Patient Safety



## WARNINGS:

### General

- Before using any system component, or any component compatible with this system, read and understand the instructions. Pay particular attention to WARNING information. Become familiar with the system components prior to use.
- Only trained and experienced healthcare professionals may use this equipment.
- Healthcare professionals should be thoroughly familiar with the instructions for use, handling characteristics, and the indicated and intended uses of this equipment. Contact your Stryker sales representative or Stryker Neptune Customer Service for in-service training. See the *Contact Information* section.
- The healthcare professional performing any procedure is responsible for determining the appropriateness of this equipment and the specific technique used for each patient. Stryker, as a manufacturer, does not recommend surgical procedure or technique.
- DO NOT disassemble, modify, service, or repair any system component or accessory, unless otherwise specified. Call Stryker Neptune Customer Service. See the *Contact Information* section.
- Upon initial receipt and before each use, inspect each component for damage. DO NOT use any equipment if damage is apparent or the inspection criteria are not met. See the *Inspection and Maintenance* section for inspection criteria.
- ALWAYS operate the equipment within the specified environmental condition values. See the *Specifications* section.
- The canister scale and fluid volume display are not diagnostic tools. DO NOT use the scale or fluid volume display to determine the amount of fluid lost from or retained by the patient.
- DO NOT cover the device control panel with drapes or other objects. Make sure the control panel can be clearly seen.
- TIPPING HAZARD — DO NOT lean on the rover.

### Low Suction

- LOW SUCTION HAZARD

NOT FOR USE as a suction source for the following applications:

- Organ stabilizer/positioner devices
- Patient positioner devices

Death or serious injury can result from fluctuating suction levels.

### High Suction

- HIGH SUCTION DEVICE [MAX = 480 mm-Hg]
  - The effectiveness of aspiration is dependent upon the intensity of the vacuum applied.
  - ALWAYS use the minimum suction limit setting required to achieve the desired clinical outcome.
  - ALWAYS follow your institution's guidelines for suction limits.
  - DO NOT connect directly to chest tubes.
  - DO NOT connect to closed wound drains.
  - DO NOT connect directly to tracheal tubes.
  - NOT FOR USE as a suction source for intermittent suction applications.

Death or serious injury can result from improper suction levels.

- The suction limit setting may only be adjusted by the SUCTION LIMIT SETTING dial on the control panel. Interruption and restoration of rover power, whether accidental or intentional, does not reset the suction limit setting to zero. See ISO 10079-1: 1999, clause 13.8. Use caution when activating suction with a high suction limit setting.

### Electrical Safety

- Use only Stryker-approved system components and accessories, unless otherwise specified. Using other electronic components and accessories may result in increased electromagnetic emissions or decreased electromagnetic immunity of the system.
- Take special precautions regarding electromagnetic compatibility (EMC) when using medical electrical equipment like this system. Install and place this system into service according to the EMC information contained in this manual. See the *Specifications* section. Portable and mobile radio frequency (RF) communications equipment can affect the function of this system.
- ELECTRICAL SHOCK HAZARD
  - ALWAYS connect this equipment to a hospital-grade, facility power receptacle with protective earth (ground).
  - DO NOT touch or make contact with the rover and patient simultaneously.

Failure to comply may cause electrical shock and result in patient or healthcare staff injury.

## User/Patient Safety



### WARNINGS:

## Environmental/Biological

- **FIRE HAZARD** – DO NOT use this equipment in areas in which flammable anesthetics or flammable agents are mixed with air, oxygen or nitrous oxide. Failure to comply may cause a fire and result in burn injury or property damage.
- **BLOODBORNE PATHOGEN HAZARD**
  - The Bloodborne Pathogens Standard provided by the United States Occupational Safety and Health Administration (US OSHA 29 CFR 1910.1030) requires those with employees having occupational exposure to potentially infectious materials to establish a written Exposure Control Plan. The Exposure Control Plan is designed to eliminate or minimize employee exposure through use of personal protective equipment (PPE), appropriate vaccinations (e.g. hepatitis B), and other control measures.
  - ALWAYS wear PPE when operating or handling this equipment.
  - ALWAYS follow local regulations regarding proper handling and disposal of biohazard waste.

Failure to comply may cause infection and result in healthcare staff injury.

- ALWAYS clean the equipment as indicated upon initial receipt and before each use. DO NOT place the rover within the sterile field. Failure to comply may cause infection and result in patient or healthcare staff injury.
- **CONTAMINATION HAZARD**
  - DO NOT collect fluids from patients being treated with radioisotopes or hazardous chemical agents.
  - ALWAYS follow local regulations for safe handling, recycling, and disposal of biohazard fluid waste and equipment. See *Disposal/Recycle* section.

Failure to comply may cause environmental contamination and result in injury.



### WARNINGS:

- The manifold is for **SINGLE PATIENT USE ONLY**. DO NOT sterilize or reuse. DO NOT reuse, reprocess, or repackage a single use device. A single use device is intended for a single use only. The single use device may not withstand chemical, chemical vapor, or high temperature sterilization reprocessing. Design features may make cleaning difficult. Reuse may create a serious risk of contamination and may compromise the structural integrity of the device resulting in operational failure. Critical product information may be lost if the device is repackaged. Failure to comply may lead to infection or cross-infection and result in patient or healthcare staff injury.
- ALWAYS make sure rover power is ON when collecting fluid waste. The rover can only detect full canisters if the rover is ON. If the rover is OFF, biohazard waste leakage or loss of suction can occur.

## Features

### Rover Front View (Figure 5)

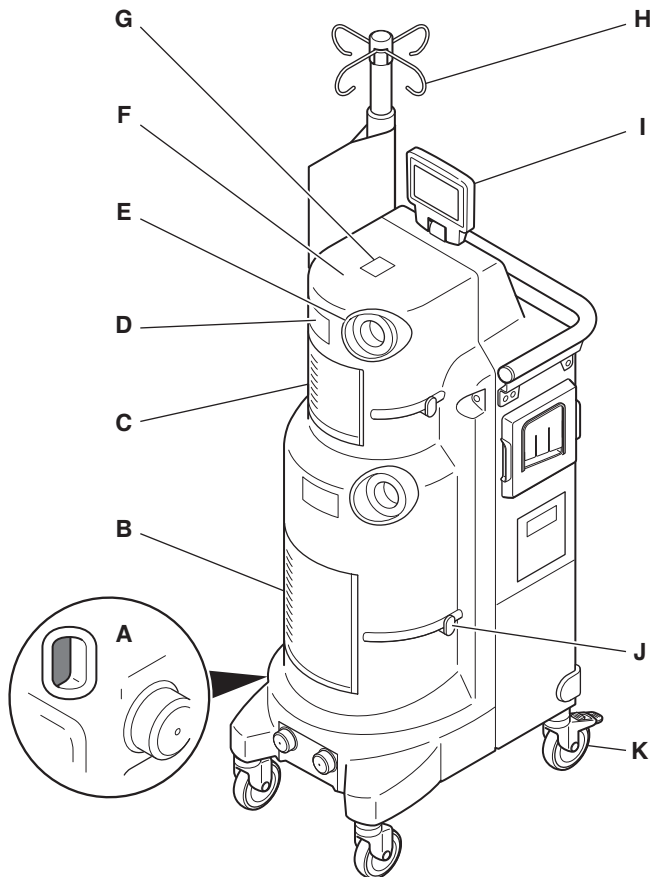
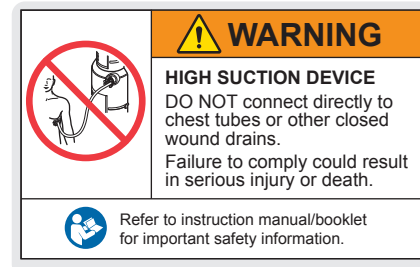


Figure 5 Rover Front View

- |          |   |
|----------|---|
| <b>A</b> | <b>Infrared Communication Window</b> – Allows data transfer between the docker and rover. Data transfer is necessary during the docking procedure.  |
| <b>B</b> | <b>20L (20-liter) Canister</b> – Allows for the collection and containment of liquids. The 20-liter canister receives fluid through an installed manifold during the collection of fluid waste. The canister contains a fluid level sensor to provide input to the fluid level display.   |
| <b>C</b> | <b>4L (4-liter) Canister</b> – Allows for the collection and containment of liquids. The 4-liter canister receives fluid through an installed manifold during the collection of fluid waste. The canister contains a fluid level sensor to provide input to the fluid level display. The contents of the 4-liter canister may be emptied into the 20-liter canister. See the <i>To Manage Full Canisters</i> section. |

### D High Suction Device WARNING Label (two) –



- |          |   |
|----------|---|
| <b>E</b> | <b>Manifold Port (two)</b> – Allows installation of a disposable manifold into the canister. The port will close automatically when a manifold is removed. Closure prevents fluid leakage during transport and docking and prevents foreign objects from entering the canister. |
|----------|---|

- |          |  |
|----------|--|
| <b>F</b> | <b>Speaker</b> – Located inside the rover, provides audible event indicators. See the <i>Audible Event Indicators</i> table. |
|----------|--|

### G Tipping Hazard WARNING Label –



- |          |   |
|----------|---|
| <b>H</b> | <b>Powered IV Pole</b> – This motor-powered IV pole is capable of holding four three-liter [3000 mL] IV bags, one bag per hook. The IV pole will return to its lowest position automatically when power is removed from the rover to ensure proper clearance during relocation. |
|----------|---|

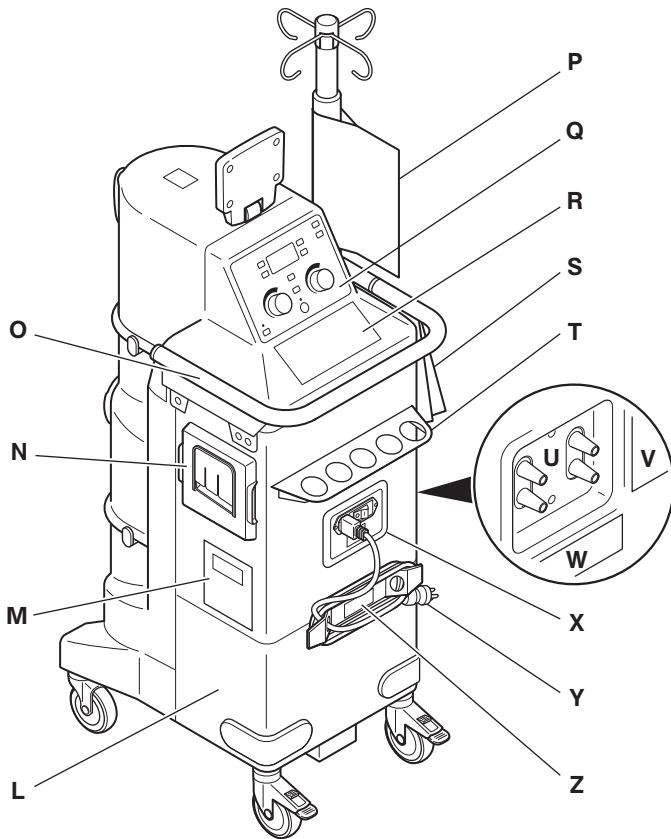
- |          |   |
|----------|---|
| <b>I</b> | <b>Fluid Level Display</b> – Provides a visual display of the fluid volume values of each canister. The display swivels in a 360-degree fashion and pivots for ease of viewing. The units of measurement may be changed to liters [L], cubic centimeters [cc], or milliliters [mL]. Display brightness may also be adjusted. See the <i>To Adjust the Rover Settings</i> section. |
|----------|---|

- |          |  |
|----------|--|
| <b>J</b> | <b>Canister Access Door/Knob (two)</b> – Each canister has access doors with knobs. These doors may be opened during operation to reveal the contents or closed during relocation to conceal the contents. |
|----------|--|

- |          |   |
|----------|---|
| <b>K</b> | <b>Casters (four)</b> – Four swivel casters allow the rover its mobility. The two rear casters have locks to prevent inadvertent movement during operation. |
|----------|---|

## Features

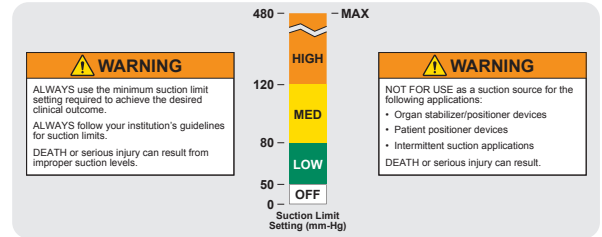
### Rover Back View (Figure 6)



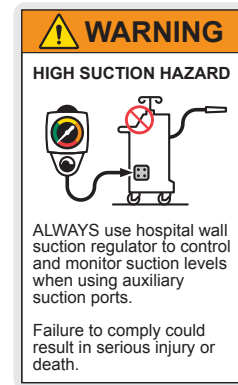
### Figure 6 Rover Back View

- |          |   |
|----------|---|
| <b>L</b> | <b>Single Vacuum Pump (not shown)</b> – Creates suction for both canisters. If the suction level decreases in either canister, due to an open port, the suction level in the other canister may decrease.   |
| <b>M</b> | <b>Fluid Suction HEPA Filter Compartment</b> – Allows for the installation and removal of a disposable fluid suction filter. This filter (included) provides High Efficiency Particulate Air (HEPA) filtration of the air from the 20-liter and 4-liter canisters. See the <i>Inspection and Maintenance</i> section. |
| <b>N</b> | <b>Smoke Evacuator ULPA Filter Compartment</b> – Allows for the installation and removal of a disposable smoke evacuator filter (not included) with an Ultra Low Penetrating Air (ULPA) efficiency rating.  |
| <b>O</b> | <b>Handle</b> – Allows for relocation and positioning of the rover.   |
| <b>P</b> | <b>WARNING Flag</b> – Allows for quick access to specific HIGH SUCTION DEVICE WARNING information.  |
| <b>Q</b> | <b>Control Panel</b> – Allows the operation of the rover using dials and push buttons. The panel also provides visual feedback through a control panel display. See the <i>Features, Control Panel</i> section.   |

**R Suction Chart and WARNINGS Label –**



- |          |   |
|----------|---|
| <b>S</b> | <b>Quick Reference Cards</b> – Allows for quick access to specific system information, warnings, and troubleshooting information.   |
| <b>T</b> | <b>Manifold Holder</b> – Allows for the storage of new, unused manifolds.   |
| <b>U</b> | <b>Auxiliary Suction Ports (optional)</b> – Allow connection to a hospital wall suction regulator if an alternate suction source is required. See the <i>Appendix, To Use Auxiliary Suction Ports (optional)</i> section. |
| <b>V</b> | <b>High Suction Hazard WARNING Label</b> –  |

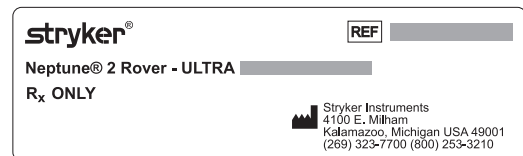


- |          |  |
|----------|--|
| <b>W</b> | <b>Auxiliary Suction Ports Label –</b> |
|----------|--|



- |          |  |
|----------|--|
| <b>X</b> | <b>Power Cord Receptacle/Switch</b> – Connect facility power to the receptacle using the rover power cord. Push the toggle switch to apply or remove facility power. See the <i>Definitions</i> section for ON and OFF power symbol definitions. |
| <b>Y</b> | <b>Power Cord Bracket/Cord</b> – Store the power cord on the bracket. Use the power cord to connect the rover to facility power.   |
| <b>Z</b> | <b>Specification Label</b> –   |

- |          |                              |
|----------|------------------------------|
| <b>Z</b> | <b>Specification Label –</b> |
|----------|------------------------------|



# Features

## Control Panel (Figure 7)

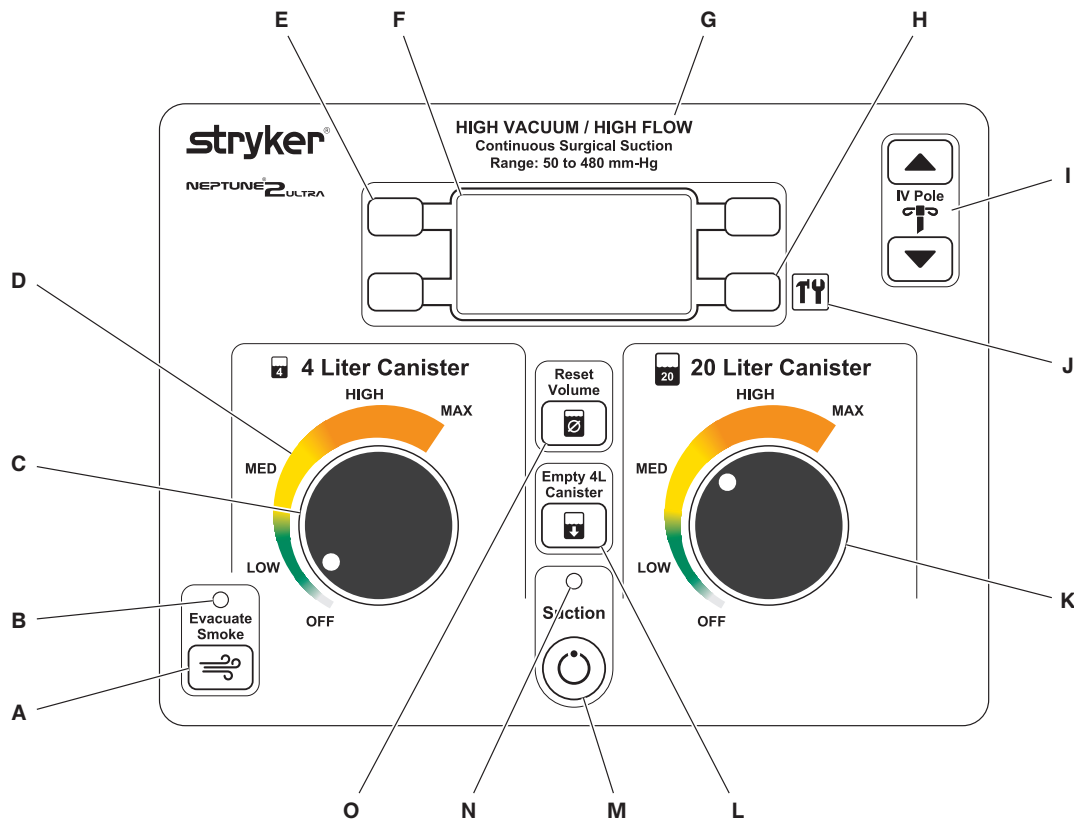


Figure 7 Control Panel

<b>A</b>	<b>Evacuate Smoke Button</b> – Push the button to start or stop smoke evacuation. See the <i>Smoke Evacuator Modes of Operation</i> table for options.	<b>H</b>	<b>System Setup Button</b> – Push and hold the button until the SYSTEM SETUP screen appears with options.
<b>B</b>	<b>Evacuate Smoke Indicator</b> – Illuminates when smoke evacuator is activated.	<b>I</b>	<b>IV Pole Buttons</b> – Push and hold the UP or DOWN arrow button to raise or lower the height of the IV pole, respectively.
<b>C</b>	<b>4L (4-liter) Suction Limit Setting Dial</b> – Turn the dial to adjust the suction limit of the 4-liter canister. The suction value will be indicated on the control panel display as a limit SETTING value or an ACTUAL value. See the <i>Features, Control Panel Display Screens</i> section and the <i>Definitions, Suction Limit Setting Dial Colors</i> table.	<b>J</b>	<b>System Setup Symbol</b> – Push and hold the push button next to this symbol to access the SYSTEM SETUP screen and change rover settings. See the <i>To Adjust the Rover Settings</i> section.
<b>D</b>	<b>Suction Limit Setting Ranges</b> – See the <i>Definitions, Suction Limit Setting Dial Colors</i> table section for codes and suction limit range information before adjusting the SUCTION LIMIT SETTING dials.	<b>K</b>	<b>20L (20-liter) Suction Limit Setting Dial</b> – Turn the dial to adjust the suction limit of the 20-liter canister. The suction value will be indicated on the control panel display as a limit SETTING value or an ACTUAL value. See the <i>Features, Control Panel Display Screens</i> section and the <i>Definitions, Suction Limit Setting Dial Color</i> section.
<b>E</b>	<b>Control Panel Display Push Buttons (four)</b> – Push the appropriate button to interact with the display.	<b>L</b>	<b>Empty 4L Canister Button</b> – Push the button to transfer the contents of the 4-liter canister into the 20-liter canister. Transfer requires confirmation.
<b>F</b>	<b>Control Panel Display</b> – Provides suction values for each canister, system status and error code messages; also displays wash cycle options during the docking procedure. Display brightness and contrast may also be adjusted. See the <i>To Adjust the Rover Settings</i> section.	<b>M</b>	<b>Suction ON/OFF Button</b> – Push the button to start or stop fluid suction.
<b>G</b>	<b>HIGH VACUUM / HIGH FLOW Continuous Surgical Suction Range: 50 to 480 mm-Hg</b> – See the <i>Specifications</i> section.	<b>N</b>	<b>Suction ON/OFF Indicator</b> – Illuminates when fluid suction is activated.
		<b>O</b>	<b>Reset Volume Button</b> – Push the button to reset the fluid display level of both canisters to zero values. Reset requires confirmation.

Features

Control Panel Display Screens

(Figures 8 and 9)

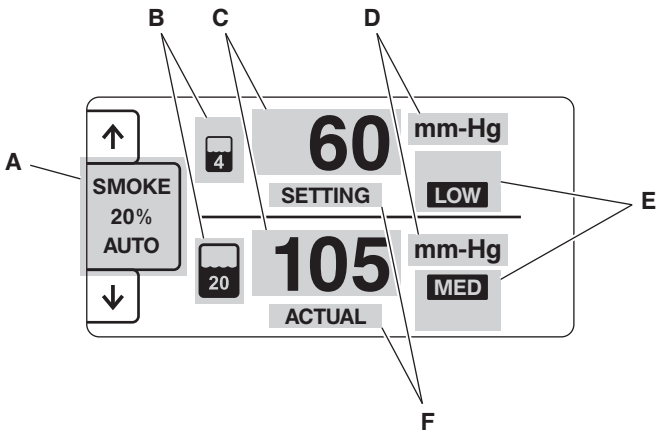


Figure 8 CONTROL Screen

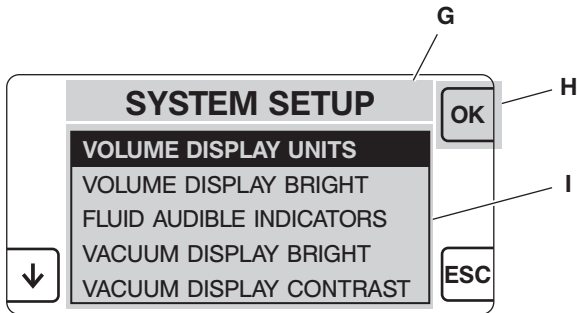










Figure 9 MENU/MESSAGE Screen Example

A	<b>Smoke Evacuation Information Area</b> – The area includes the power setting during operation and the mode of operation. See the <i>Smoke Evacuator Modes of Operation</i> table for details.
B	<b>Canister Identification Area</b> – The 4-liter canister information is on the top half of the display. The 20-liter canister information is on the bottom half of the display.
C	<b>Suction Level Value Areas</b> – Each area provides the suction level value for the corresponding canister. If the suction supplied through the auxiliary suction ports exceeds the value of 570 mm-Hg, the control panel display will no longer indicate a value, but will show dash marks [---].
D	<b>Suction Level Unit of Measure Areas</b> – Each area provides the suction value units of measure for the corresponding canister.
E	<b>Suction Limit Range Indicator Areas</b> – Each area indicates whether the suction limit value is in the HIGH, MED(ium) or LOW range for the corresponding canister. See the <i>Definitions, Suction Limit Setting Dial Color</i> section for suction limit range information.
F	<b>Suction Information Type Area</b> – These areas indicate the type of suction information being displayed for each canister: SETTING indicates the displayed value is the suction limit SETTING selected by the user. It is shown whenever the corresponding setting dial is adjusted, and persists for 5 seconds after adjustment is complete.  ACTUAL indicates the displayed value is the current suction level actually present in the canister. The ACTUAL value is displayed whenever the suction limit SETTING is not being adjusted. The ACTUAL value may fluctuate and could be significantly lower than the SETTING value.
G	<b>Title Area</b> – The area indicates the type of screen displayed, including menu or message screens.
H	<b>Push Button Label Areas</b> – Four areas that correspond to the adjacent control panel display push buttons and indicate the button's function. See the <i>Definitions, Control Panel Button Screen Icons</i> table.
I	<b>Message Area</b> – The area displays system setup options, wash cycle options, warnings, and error message information.


















## Definitions

### Control Panel Button Screen Icons


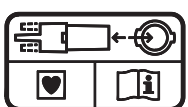
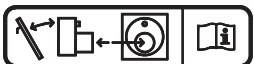

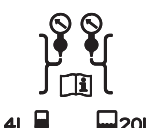


LABEL / ICON	NAME	DEFINITION
	DOWN/DECREASE	Scroll down to highlight an option or decrease a value.
	UP/INCREASE	Scroll up to highlight an option or increase a value.
	ERROR INDICATOR	Access ERRORS screen to view error(s). See the <i>Error Code Messages</i> section.
	ESC	Close or ESCape a screen without accepting changes or selections and return to previous screen.
	OK	Accept changes and return to the previous screen. Select an error message and access message screen.
	RESET	RESET the timer value when either the fluid suction filter or the smoke evacuator filter is replaced.
	SELECT MARK	Icon indicates screen option is selected and applied.
	CONSULT INSTRUCTIONS FOR USE	Icon indicates the need to consult <i>instructions for use</i> , specifically error message information.

## Symbols

The symbols located on the equipment and/or labeling are defined in this section or in the *Symbol Definition Chart*. See the *Symbol Definition Chart* supplied with the equipment.





SYMBOL	DEFINITION
	ON (POWER)
	OFF (POWER)
	SUCTION ON/OFF
	4-LITER (4L) CANISTER
	20-LITER (20L) CANISTER
	RESET VOLUME
	EMPTY 4L CANISTER
	IV POLE HEIGHT ADJUSTMENT
	EVACUATE SMOKE
	SUCTION LIMIT SETTING
	SYSTEM SETUP
	CONSULT INSTRUCTIONS FOR USE
	REFER TO INSTRUCTION MANUAL/BOOKLET
	GENERAL WARNING SIGN
	ALTERNATING CURRENT (AC)
	DIRECT CURRENT (DC)
	TYPE CF APPLIED PART



SYMBOL	DEFINITION
	PROTECTIVE EARTH (GROUND)
	MANIFOLD PORT
	FLUID SUCTION FILTER COMPARTMENT
	SMOKE FILTER COMPARTMENT
 4L  20L 	AUXILIARY SUCTION PORTS

## Suction Limit Setting Dial Colors

**NOTE:** Each color is associated with a suction range as shown in the suction chart located below the control panel. See the *Features* section for more information.

COLOR	SUCTION LIMIT	RANGE	INCREMENTS
Orange – 	MAX(IUM)	480 mm-Hg	Not Applicable
	HIGH	120 to 480 mm-Hg	20 mm-Hg
Yellow – 	MED(IUM)	80 to 115 mm-Hg	5 mm-Hg
Green – 	LOW	50 to 75 mm-Hg	5 mm-Hg
White – 	OFF	0 mm-Hg	Not Applicable

## Fluid Level Display Screen Messages

MESSAGE	DEFINITION
FULL	Indicates a canister is full (Figure 10). See the <i>Fluid Volume Indicators</i> table.
Error	Indicates a serious error has occurred. See the control panel display for the specific error message and the <i>Error Code Messages</i> section.
----	Dashes indicate the value of the volume is in transition or an error has occurred. The system may still be used.

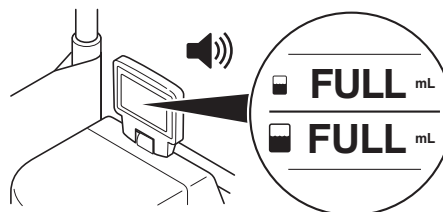


Figure 10 Fluid Level Display

## Audible Event Indicators

This table describes the audible indicators associated with each type of system event.

TYPE	INDICATION	EXAMPLE
Button Actuation	One short beep	EMPTY 4L CANISTER button is pushed; EMPTY 4L CANISTER is started. RESET VOLUME button is pushed.
Task Completion	Three short beeps	Docking cycle is complete. 4-liter canister has been emptied into the 20-liter canister.
General Notification	One long beep	Message or error information appears on control panel display screen. See the <i>Error Code Messages</i> section.
Lost Functionality	Two long beeps	Message or error information appears on control panel display screen. See the <i>Error Code Messages</i> section.

**NOTE:** For additional indicators, see the *High Suction Indicator* section and the *Fluid Volume Indicators* section.



# Instructions

## Before First Use

### To Unpack the Rover



**WARNING:** HEAVY EQUIPMENT - ALWAYS have more than one person unpack and move this equipment from the shipping pallet. See the *Specifications* section for rover weight. Failure to comply may result in personal injury.

1. Remove the exterior packaging materials from the rover and recycle the material as required.
2. Using at least two people, remove the rover from the shipping pallet.
3. Inspect the rover and components for damage. If damage is apparent, DO NOT use the equipment.

COMPONENTS	REF
120 VAC ULTRA Rover	0702-001-000
Domestic Power Cord	6000-115-160
Instructions for Use (IFU)	0702-002-700
Neptune 2 Docking Station	9100-001-179
Instruction Poster	

### To Initially Dock the Rover

**NOTE:** Initial docking of the rover is required to replace the transport fluid in the canisters with prefill fluid. Failure to comply will result in prefill errors and prevent the rover from operating properly. See the *To Dock the Rover* section to perform initial docking of the rover.

### To Test the Rover

#### 1. To Connect Power

- a. Connect the rover to facility electrical power using the power cord. Insert the plug of the power cord through the strain relief hole before connecting the cord to the rover (Figure 11).
- b. Push the power switch to the ON position.

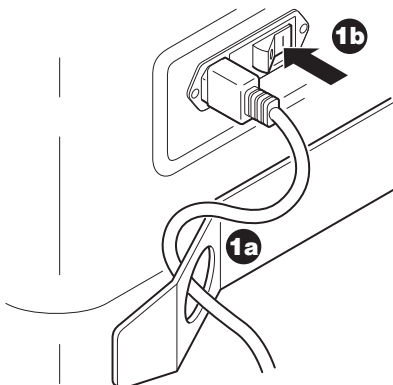


Figure 11 Power Cord Strain Relief

- c. Read the WARNING message on the control panel display, then push the control panel display button next to OK to access the CONTROL screen (Figure 12).

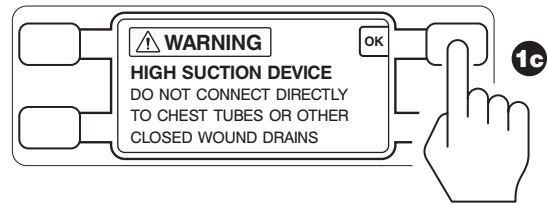


Figure 12 High Suction Device Warning

#### 2. To Test Fluid Suction

- a. Push the SUCTION button to start the vacuum pump (Figure 13). Make sure the vacuum pump starts. If not, see the *Troubleshooting* section and the *Error Code Messages* section.
- b. Adjust the SUCTION LIMIT SETTING dial of the canister to be tested to the maximum suction level. Make sure the value displayed on the control panel changes and reaches a maximum suction level between 475 and 480 mm-Hg. If not, see the *Troubleshooting* section and the *Error Code Messages* section.
- c. Repeat step b to test the other canister.

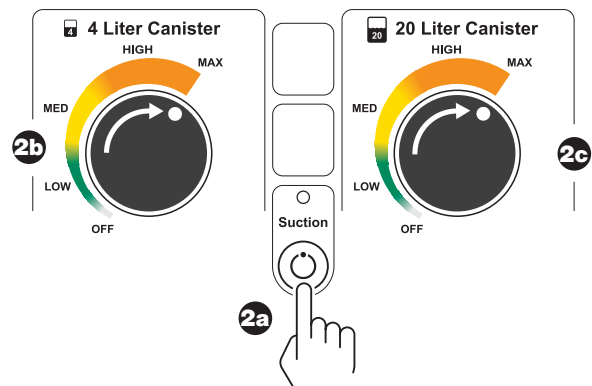


Figure 13 To Test Fluid Suction

#### 3. To Test the IV Pole

Push the UP and DOWN ARROW buttons to raise and lower the IV pole (Figure 14). Make sure the IV pole functions correctly. If not, see the *Troubleshooting* section and the *Error Code Messages* section.

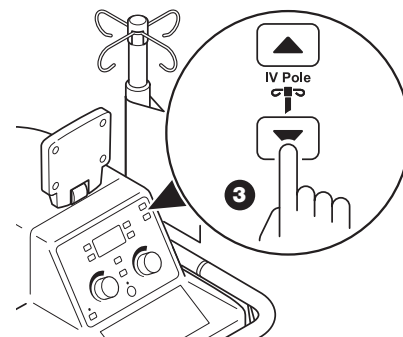


Figure 14 To Test IV Pole

#### 4. To Test Smoke Evacuation

##### NOTES:

- Make sure a smoke evacuator filter is installed in the rover before testing smoke evacuation. See the *Accessories* section. See the *instructions for use* supplied with the smoke evacuator filter for installation information.
  - The rover tracks the life expectancy of the smoke evacuator filter. DO NOT relocate the smoke evacuator filter after initial installation into the rover.
- a. Push the EVACUATE SMOKE button (Figure 15).



Figure 15 To Test Smoke Evacuation

- b. From the control panel display, push the buttons next to the arrow icons to adjust the smoke evacuator power (Figure 16). Make sure the smoke evacuation functions correctly. If not, see the *Troubleshooting* section and the *Error Code Messages* section.

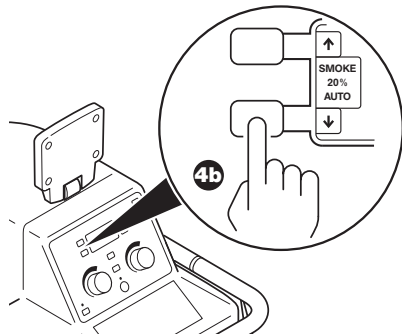


Figure 16 To Adjust Smoke Evacuation

**NOTE:** See the *To Adjust the Rover Settings* section to make setting changes as required.

#### To Adjust the Rover Settings

1. Make sure the power cord is connected between the rover and facility power.
2. Make sure the power switch is in the ON position and the HIGH SUCTION DEVICE WARNING has been acknowledged.
3. From the control panel, push and hold the push button until the SYSTEM SETUP screen appears (Figure 17).

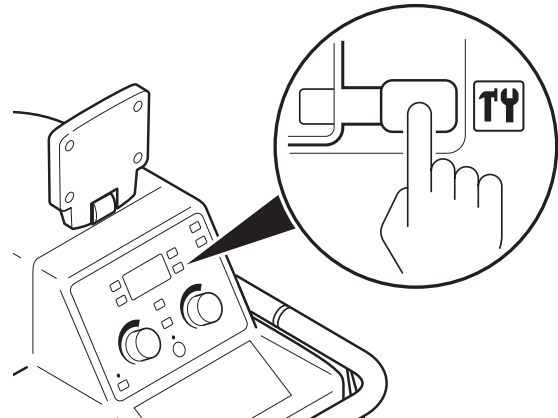


Figure 17 To Access System Setup

4. From the SYSTEM SETUP screen, push the buttons next to the arrow icons to highlight the appropriate system setting. Push the button next to OK to view the desired system setting screen (Figure 18).

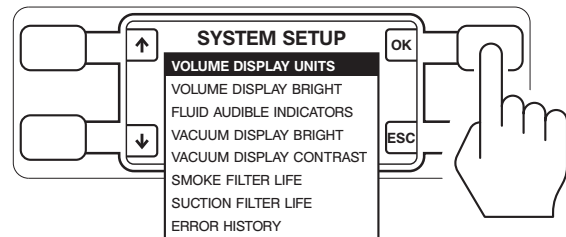


Figure 18 System Setup Screen

## To Adjust the Rover Settings (continued)

- From a SYSTEM SETTING screen, push the buttons next to the arrow icons to highlight or adjust the appropriate setting option. See the *System Setup Options* table for available setting options.
- Push the button next to the OK icon to select the appropriate system setting option (Figure 19). Push the button next to the ESC icon to cancel the selection and exit the screen.

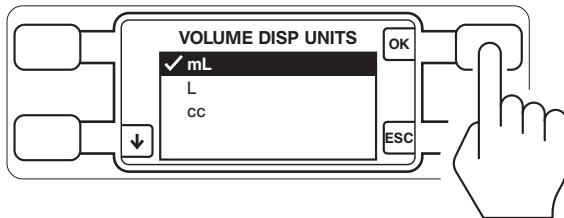


Figure 19 Sample System Setting Screen

**NOTE:** To reset the smoke evacuator filter timer or fluid suction filter timer, see the *instructions for use* supplied with the filter for more information.

## System Setup Options

FLUID LEVEL DISPLAY	OPTIONS		FACTORY DEFAULT
VOLUME DISPLAY UNITS	mL [milliliter] L [liter] cc [cubic centimeter]		mL
VOLUME DISPLAY BRIGHTness	0 - 100%		75%
FLUID AUDIBLE INDICATORS	4L canister	0 - 2000 mL	600 mL (remaining capacity)
	20L canister	0 - 10,000 mL	2000 mL (remaining capacity)

CONTROL PANEL DISPLAY	OPTIONS		FACTORY DEFAULT
VACUUM DISPLAY BRIGHTness	0 - 100%		75%
VACUUM DISPLAY CONTRAST	0 - 100%		70%

MAINTENANCE	OPTIONS		FACTORY DEFAULT
SMOKE FILTER LIFE	Reset timer to accept		80 hours
SUCTION FILTER LIFE	Reset timer to accept		500 hours
ERROR HISTORY	See the <i>Error Code Messages</i> section.		Not Applicable

**NOTE:** After adjusting the rover system settings, disconnect the rover from facility power and wrap the power cord around the power cord bracket. The rover is now ready to be used in an operating room setting.

## Before the Procedure

### To Setup the Rover



#### WARNINGS:

- Upon initial receipt and before each use, inspect each component for damage. DO NOT use any equipment if damage is apparent or the inspection criteria are not met. See the *Inspection and Maintenance* section for inspection criteria. DO NOT use the rover until it has been tested properly to ensure functionality. See the *To Test the Rover* section.
- ALWAYS clean the equipment as indicated upon initial receipt and before each use. DO NOT place the rover within the sterile field. Failure to comply may cause infection and result in patient or healthcare staff injury.

**CAUTION:** DO NOT clamp or attach any accessory onto the pole or base of the powered IV pole assembly.

#### NOTES:

- DO NOT use the rover until the docker has been installed and tested properly to ensure functionality. See the *instructions for use* supplied with the docker.
- The volume of the initial prefill fluid in the canister(s) is accounted for in the fluid level value indicated on the fluid level display. Foam does not affect this fluid level value.
- ALWAYS close unused manifold ports, and remove or clamp unused tubing to maintain optimal suction levels. The suction level in each canister is degraded by the suction demand on the other canister.

#### 1. To Connect Power (Figure 20)

- Position the rover on a flat surface and in a convenient location within the operating room.
- Lock the rover's two rear casters to prevent rover movement.
- Orient the rover's fluid level display for optimal viewing.
- Open the canister access doors from each side of the rover to allow viewing of the contents.

**CAUTION:** ALWAYS use the correct power cord. Configurations may vary.

- e. Connect the rover to facility electrical power using the appropriate power cord.
- f. Push the power switch to the ON position.
- g. Read the WARNING message on the control panel display, then push the control panel display button next to OK to access the CONTROL screen (Figure 21).

**NOTE:** If the 4-liter or 20-liter suction limit setting dial is positioned in the high suction range, the rover will provide an audible and visual indication of this condition. See the *High Suction Indicator* section.

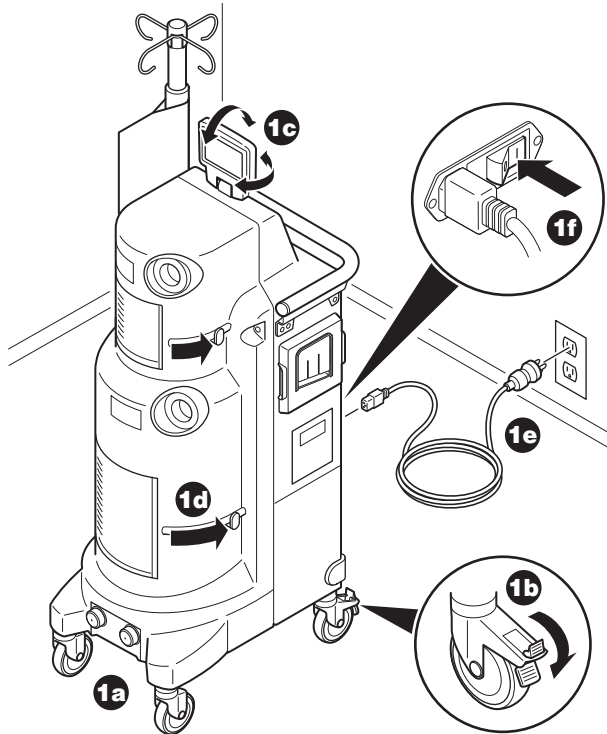


Figure 20 To Connect Power

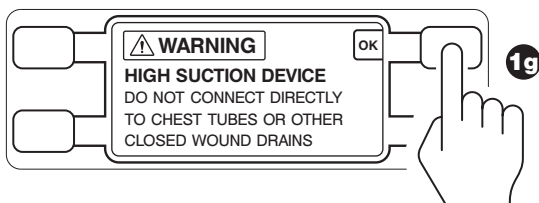


Figure 21 High Suction Device Warning

## 2. To Prepare For Fluid Suction (Figure 22)

**NOTE:** The fluid suction tubing and suction accessory are applied parts.

- a. Install new disposable manifold(s) into the manifold port(s). Make sure the manifold(s) are fully twisted and locked into place. See the *instructions for use* supplied with the manifold for more information.
- b. Attach the fluid suction tubing to the port(s) of the installed manifold(s). ALWAYS close unused manifold ports.
- c. Attach a fluid suction accessory to the end of the suction tubing if required.
- d. Push the RESET VOLUME button to reset the fluid display level value to zero if required.
- e. If the RESET VOLUME button is pushed, a confirmation screen will appear. Push the control panel display button next to OK to reset the volume levels to zero (Figure 23).

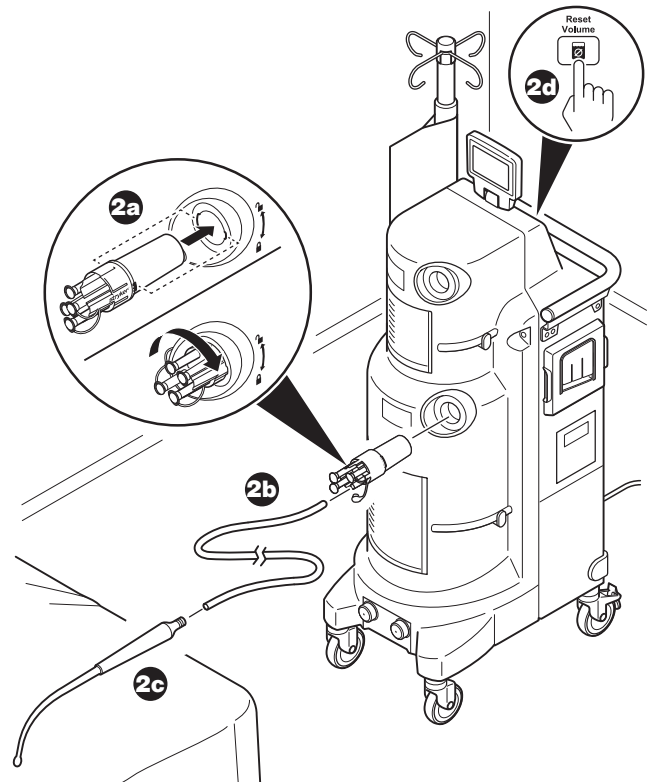


Figure 22 To Prepare for Fluid Suction

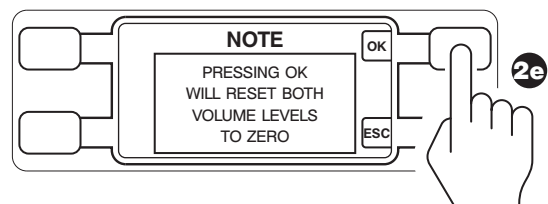


Figure 23 To Reset Volume Level to Zero

## To Setup the Rover (continued)

### 3. To Prepare For Smoke Evacuation (Figure 24)

#### NOTES:

- Make sure a smoke evacuator filter is installed in the rover before using smoke evacuation. See the *Accessories* section. See the *instructions for use* supplied with the smoke evacuator filter for installation information.
  - The smoke evacuator tubing and optional smoke evacuator attachment are applied parts.
- a. Install the smoke evacuator tubing to the smoke evacuator filter.
  - b. Install a smoke evacuator attachment to the end of the smoke tubing, if required.

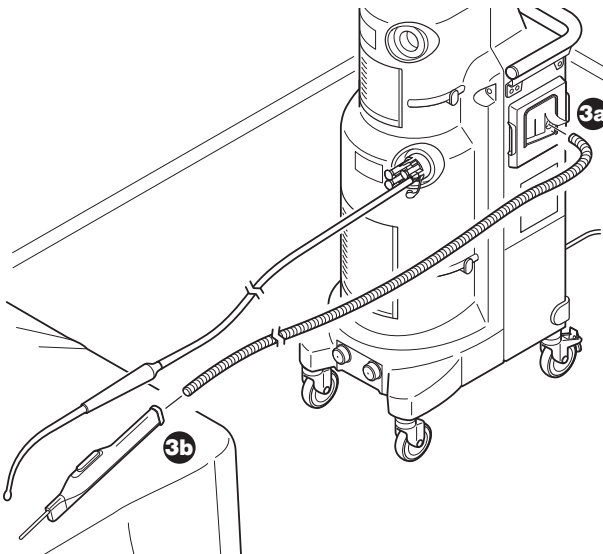


Figure 24 To Prepare for Smoke Evacuation

### 4. To Use the IV Pole (Figure 25)

**NOTE:** The IV pole will return to its lowest position automatically when power is removed from the rover.

- a. Hang one irrigation bag on each IV pole hook, if required. The maximum volume allowed per hook is 3000 milliliters.
- b. Push and hold the IV pole UP ARROW button to raise the IV pole to the desired height.

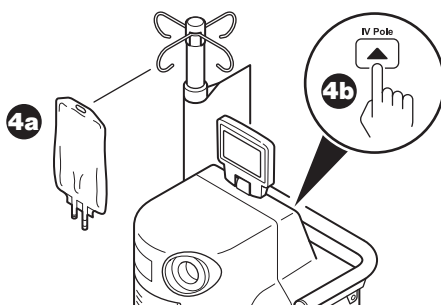


Figure 25 To Use the IV Pole

## During the Procedure

### To Operate the Rover



#### WARNINGS:

- **HIGH SUCTION DEVICE [MAX = 480 mm-Hg]**
  - The effectiveness of aspiration is dependent upon the intensity of the vacuum applied.
  - ALWAYS use the minimum suction limit setting required to achieve the desired clinical outcome.
  - ALWAYS follow your institution's guidelines for suction limits.
  - DO NOT connect directly to chest tubes.
  - DO NOT connect to closed wound drains.
  - DO NOT connect directly to tracheal tubes.
  - NOT FOR USE as a suction source for intermittent suction applications.

Death or serious injury can result from improper suction levels.

- The canister scale and fluid volume display are not diagnostic tools. DO NOT use the scale or fluid volume display to determine the amount of fluid lost from or retained by the patient.
- ALWAYS make sure rover power is ON when collecting fluid waste. The rover can only detect full canisters if the rover is ON. If the rover is OFF, biohazard waste leakage or loss of suction can occur.
- The suction limit setting may only be adjusted by the SUCTION LIMIT SETTING dial on the control panel. Interruption and restoration of rover power, whether accidental or intentional, does not reset the suction limit setting to zero. See ISO 10079-1: 1999, clause 13.8. Use caution when activating suction with a high suction limit setting.

#### LOW SUCTION HAZARD

NOT FOR USE as a suction source for the following applications:

- Organ stabilizer/positioner devices
- Patient positioner devices

Death or serious injury can result from fluctuating suction levels.

NOTES:

- This equipment provides an adjustable suction limit of 50 to 480 mm-Hg measured with all ports closed.
- Make sure the rover has been prepared for collection properly. See the *To Setup the Rover* section.
- To reset or zero the fluid level value on the fluid level display, push the RESET VOLUME button on the control panel. Both canister fluid level values will display a zero value. If power is lost and restored, the rover will display the actual fluid level value.

1. To Control Fluid Suction (Figure 26)

**NOTE:** See the *High Suction Indicator* table for important condition, indication and action information.

- a. While viewing the CONTROL screen on the control panel display, turn the appropriate SUCTION LIMIT SETTING dial to adjust to the desired suction level in the appropriate canister. See the *Definitions, Suction Limit Setting Dial Colors* section.
- b. Push the SUCTION button to start fluid suction.

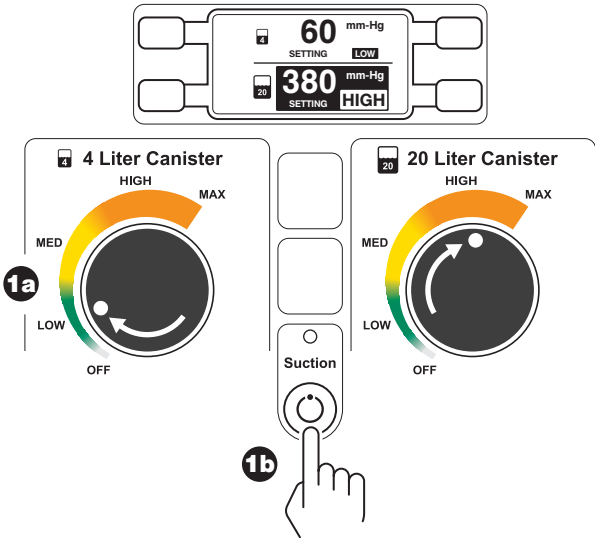


Figure 26 To Start and Adjust Suction

High Suction Indicator

**NOTE:** The condition, indication and action described in this table pertain to one or both canisters.

SUCTION CONDITION	INDICATION	ACTION
HIGH SUCTION LIMIT RANGE; the suction limit setting selected is at or above 120 mm-Hg	Three long beeps; control panel display flashes HIGH	Confirm whether a high range is desired.

2. To Control Smoke Evacuation

**CAUTION:** DO NOT use the smoke evacuator to evacuate or suction surgical fluid. Excessive amounts of fluid may cause equipment damage.

- a. Push the EVACUATE SMOKE button once for manual mode, or twice for AUTO mode (Figure 27). See the *Smoke Evacuator Modes of Operation* table for options.

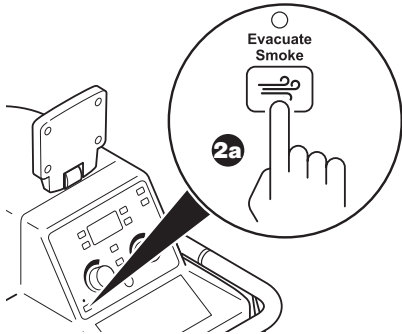


Figure 27 To Activate Smoke Evacuation

Smoke Evacuator Modes of Operation

MODE:	MANUAL	AUTO	OFF
BUTTON ACTUATION:	One	Two	Three
RESULT:	Operates at the specified power setting whether smoke is present or not. EVACUATE SMOKE indicator illuminates.	Operates at the specified power setting if smoke is present. If smoke is not detected, the smoke evacuator will operate at a 20% power setting automatically. EVACUATE SMOKE indicator illuminates.	Smoke evacuator operation stops. EVACUATE SMOKE indicator is not illuminated.



## To Operate the Rover (continued)

- b. From the smoke evacuation information area of the CONTROL screen, push the buttons next to the arrow icons to increase or decrease the smoke evacuator power setting as required (Figure 28).

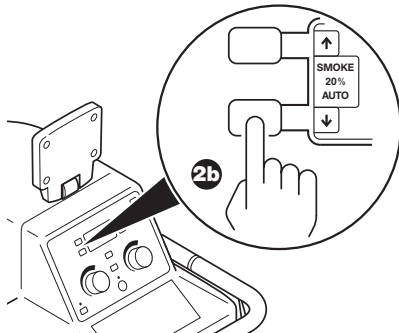


Figure 28 To Adjust Smoke Evacuation

### 3. To Adjust the IV Pole

Push and hold the IV pole UP or DOWN ARROW buttons to raise or lower the pole height, respectively (Figure 29).

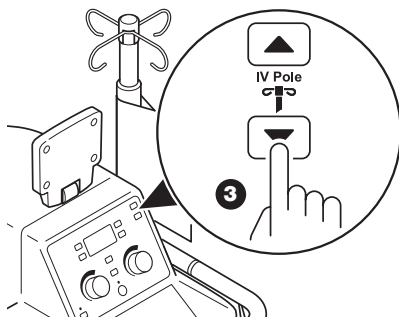


Figure 29 To Adjust IV Pole

### 4. To Manage Full Canisters



**WARNING:** Make sure suction is not immediately required before pressing the EMPTY 4L CANISTER button. Suction will be lost in both canisters for at least 30 seconds after the button is pressed.

**NOTE:** See the *Fluid Volume Indicators* table for conditions, indications and actions related to a full or almost full canister.

- a. If the 4-liter canister is full, push the EMPTY 4L CANISTER button on the control panel (Figure 30).

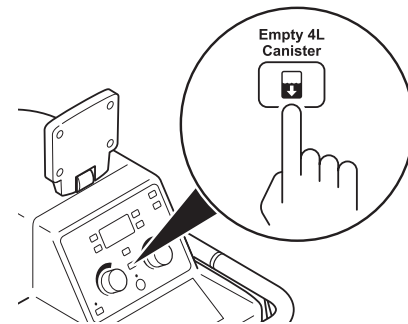


Figure 30 To Empty 4-Liter Canister

**NOTE:** If the 20-liter canister has insufficient capacity to receive the 4-liter canister fluid, a screen will appear indicating the rover will require shutdown and docking to empty its full canisters. Push the button next to the ESC icon to acknowledge the need to dock the rover (Figure 31).

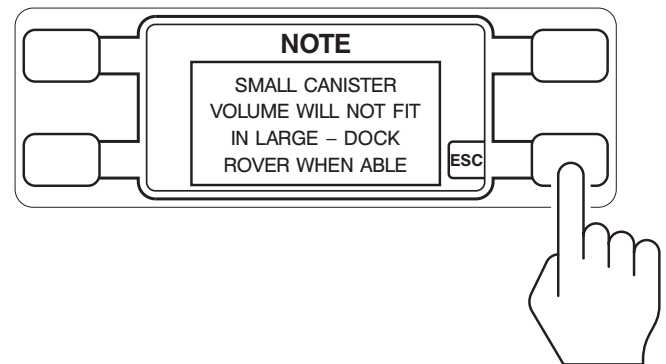


Figure 31 To Acknowledge Need to Dock Rover

- b. If the 20-liter canister can receive the contents of the 4-liter canister, a WARNING screen will appear. Push the button next to the OK icon if the loss of suction will not compromise patient safety (Figure 32).

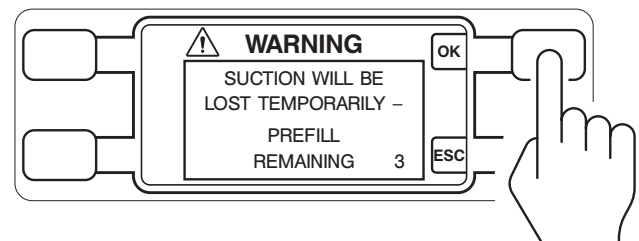


Figure 32 To Confirm Empty 4-Liter Canister

**NOTES:**

- A maximum of three EMPTY 4L CANISTER cycles are allowed between docking cycles. The number of EMPTY 4L CANISTER cycles (PREFILL) remaining is displayed.
  - The values of the fluid volume display will change accordingly after the EMPTY 4L CANISTER action is complete.
  - Liquid prefill is added to the 4L canister after the EMPTY 4L CANISTER action is complete. The sound of the pump adding liquid prefill is normal.
  - The 4-liter and 20-liter canisters will return to their previous suction limit settings after the EMPTY 4L CANISTER action is complete.
- c. If the 20-liter canister is full, shutdown the rover for relocation. Dock the rover to empty the full canister(s). See the *To Dock the Rover* section.

**Fluid Volume Indicators****NOTES:**

- The conditions, indications and actions described in this table pertain to one or both canisters.
- To adjust the settings of the ALMOST FULL audible indicators, see the *Systems Setup Options* section.

FLUID VOLUME CONDITION	INDICATION	ACTION
Almost Full – The fluid volume level is near full capacity. Fluid suction will soon stop in the full canister.	Five medium beeps; fluid level display value flashes	Prepare to switch to an alternate suction source.
FULL – The fluid volume level is at full capacity. Fluid suction has stopped in the full canister.	Continuous beeping; fluid level display flashes FULL	Push the button next to the OK icon to stop the continuous audible beeps.
		Switch to an alternate suction source.
		Relocate and dock the rover to dispose of waste.

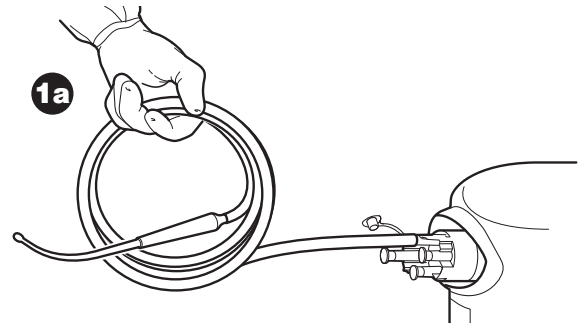
**After the Procedure****To Shutdown the Rover****WARNING:**▪ **BLOODBORNE PATHOGEN HAZARD**

- ALWAYS wear PPE when operating or handling this equipment.
- ALWAYS leave tubing attached to the manifold and close unused ports during disposal.
- ALWAYS follow local regulations regarding proper handling and disposal of biohazard waste.

Failure to comply may cause infection and result in healthcare staff injury.

**1. To Remove Fluid Suction Components**

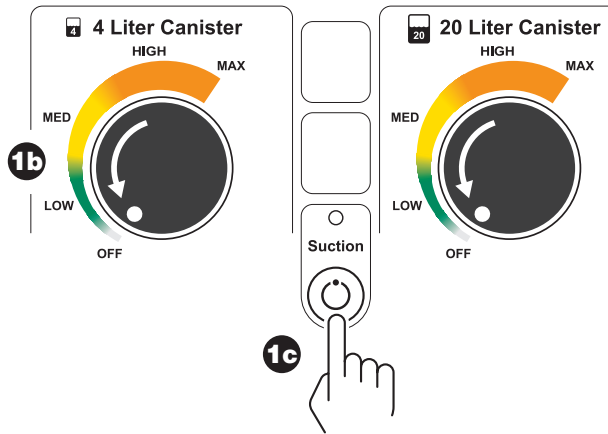
- a. With suction active, gather the suction tubing toward the manifold port to purge the tubing of fluid waste. DO NOT remove any attached suction tubing from the manifold (Figure 33).

**Figure 33 To Gather Suction Tubing**



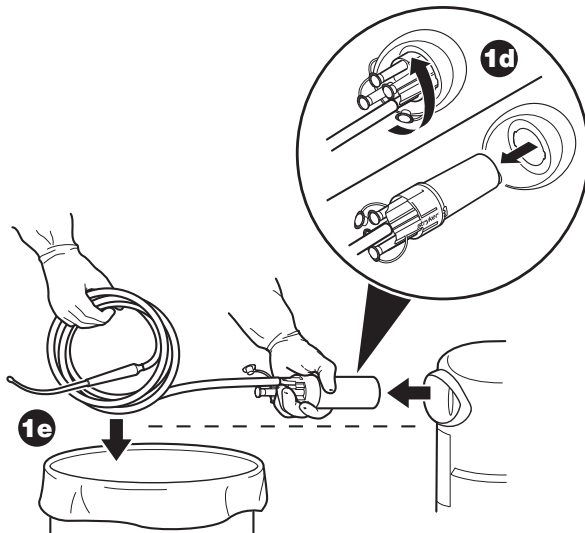
## To Shutdown the Rover (continued)

- b. Turn the SUCTION LIMIT SETTING dial to zero for the canister with the manifold to be removed (Figure 34).
- c. Push the SUCTION button on the control panel to stop fluid suction.



**Figure 34 To Shutdown Suction**

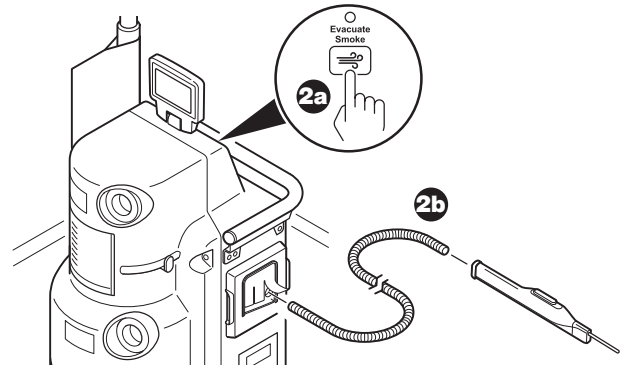
- d. Rotate the manifold until it is unlocked, then pull the manifold and attached suction tubing out of the receptacle, always keeping the manifold in a horizontal orientation (Figure 35).
- e. Properly dispose of the used manifold and attached suction tubing always maintaining the manifold in a horizontal orientation.
- f. Remove all the remaining fluid suction accessories as required.



**Figure 35 To Remove Manifold and Tubing**

## 2. To Remove Smoke Evacuation Components (Figure 36)

- a. Push the EVACUATE SMOKE button on the control panel until smoke evacuation stops and the indicator is not illuminated.
- b. Remove the smoke evacuator tubing with any attachments.

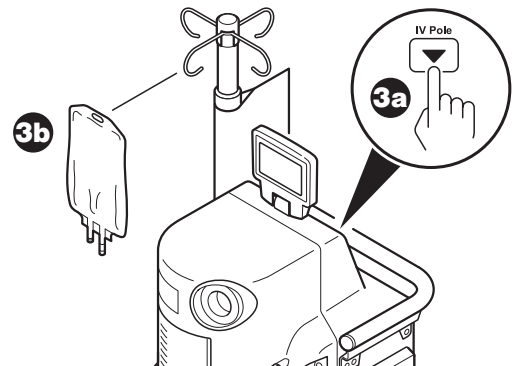


**Figure 36 To Remove Smoke Evacuation Components**

- c. Properly dispose of the used smoke evacuator tubing and any attachments.

## 3. To Remove IV Pole Components (Figure 37)

- a. Push the IV POLE DOWN button to lower the IV pole.
- b. Remove any irrigation bags on the IV pole as required.



**Figure 37 To Remove IV Pole Components**

#### 4. To Remove Power (Figure 38)

- Push the power switch to the OFF position.
- Disconnect the rover from facility electrical power. Wrap the power cord around the cord bracket.

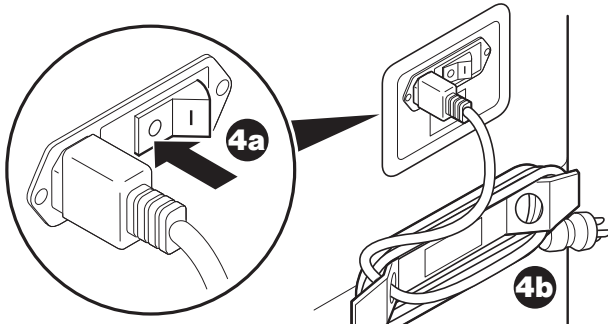


Figure 38 To Remove Power

#### 5. To Prepare for Relocation

**CAUTION:** ALWAYS remove power from the rover before relocation to make sure the IV pole is at its lowest position. Failure to comply may result in IV pole damage.

**NOTE:** Before relocation, remove all irrigation bags from the rover. The rover transport configuration is illustrated in Figure 39.

- Using the knobs, close the canister access doors to conceal the contents.
- ALWAYS wipe down the rover between each surgical use. See the *Cleaning* section.
- Unlock the two rear casters of the rover and relocate the rover as required. Use the rover handle to push and relocate the rover.

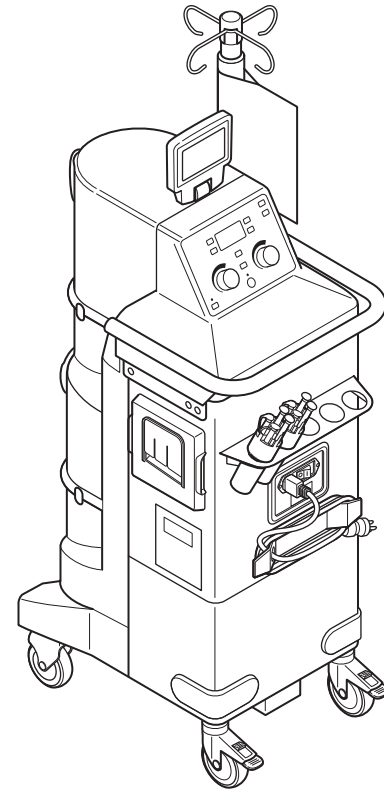


Figure 39 Transport Configuration

#### 6. To Relocate the Rover



**WARNING: TIPPING HAZARD — DO NOT** lean on the rover.

- If both canisters are full or the rover contains fluid waste and will not be used within two hours, relocate the rover to the dock using the rover handle. See the *To Dock the Rover* section.
- If the canisters are not full and the rover will be used within two hours, relocate the rover to the desired location using the rover handle. See the *To Setup the Rover* section.

#### NOTES:

- ALWAYS use the rover handle when repositioning or relocating the rover.
- Dock the rover for waste disposal as soon as possible, typically within two hours of the last use, to preclude extended wash cycles.
- The rover does not have to be connected to facility power when not in use.

## To Dock the Rover



### WARNINGS:

- ALWAYS keep hands out and away from the mating surfaces of the rover and docker during the docking procedure to avoid a pinch point hazard.
- BLOODBORNE PATHOGEN HAZARD
  - ALWAYS wear PPE when operating or handling this equipment.
  - ALWAYS follow local regulations regarding proper handling and disposal of biohazard waste.

Failure to comply may cause infection and result in healthcare staff injury.

### NOTES:

- Dock the rover for waste disposal as soon as practical, typically within two hours of the last use, to preclude extended wash cycles.
- Before docking the rover, always allow the docker to warm up for at least 60 seconds after applying power to the docker.
- For optimal cleaning of the rover canisters, use a water temperature of 37.8 to 43.3 °C [100 to 110 °F].
- The docker provides power to the rover during the docking process.
- After docking the rover, DO NOT lock the rover casters.

### 1. To Prepare the Docker (Figure 40)

- a. Make sure the power switch is in the ON position and illuminated.
- b. Make sure the bottle of Neptune Docking Detergent REF 0700-001-026 is connected, has enough detergent to perform a wash cycle, and the end of the inlet tube is located at the bottom of the bottle. See the *instructions for use* supplied with the detergent bottle.

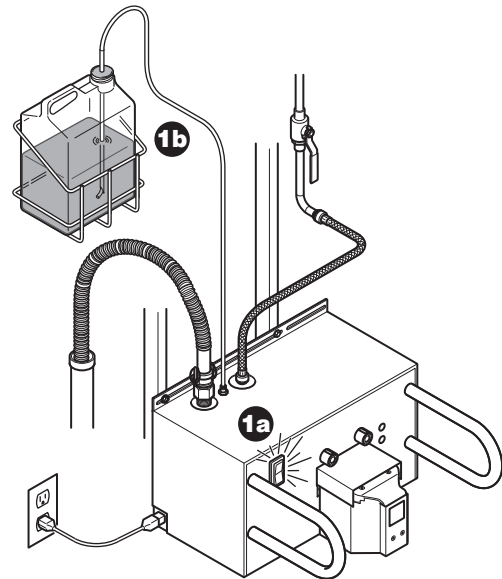


Figure 40 To Prepare the Docker

### 2. To Perform a Wash Cycle

- a. Push the rover toward the docker and between the guides until the rover and docker attach automatically (Figure 41). DO NOT lock the casters.

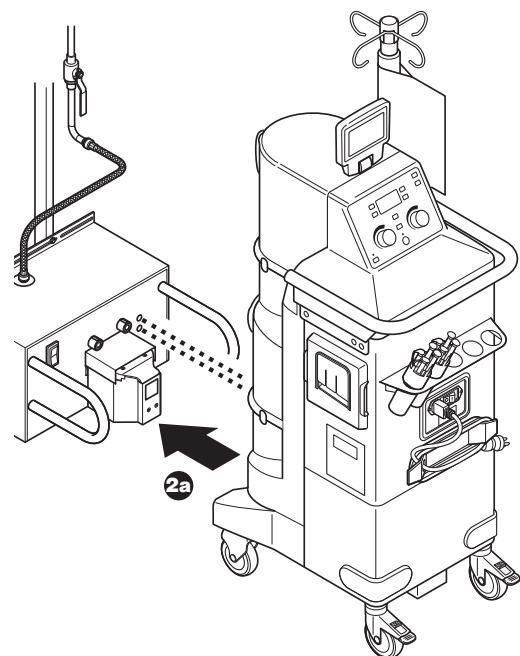


Figure 41 To Perform a Wash Cycle

b. From the SELECT CYCLE screen, push the buttons next to the arrow icons to scroll and highlight the appropriate wash cycle. Push the button next to the OK icon to select the highlighted cycle (Figure 42).

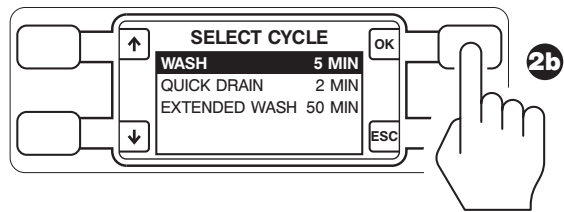


Figure 42 To Select Wash Cycle

NOTES:

- During the first rover docking procedure, the information on the control panel display may appear inconsistent. The procedure may also take a few more minutes than specified in the *Wash Cycle Options* table. Both conditions are normal and temporary.
- If a specific wash cycle is not selected within ten seconds, the WASH cycle will be performed automatically. See the *Wash Cycle Options* table.
- To exit the WASH or EXTENDED WASH cycle, push the button next to the ESC icon on the SELECT CYCLE screen to perform a QUICK DRAIN cycle. After the QUICK DRAIN cycle is complete, push the button next to the OK icon again to detach the rover from the docker.

Wash Cycle Options

CYCLES	DESCRIPTION	TIME (approx.)
WASH	Cycle drains the contents, applies detergent to the interior walls of both canisters, and rinses the detergent with water.	5 minutes
QUICK DRAIN	Cycle drains the contents of both canisters.	2 minutes
EXTENDED WASH	Cycle drains the contents, applies detergent to the interior walls of both canisters, and rinses the detergent with water. Intermittent periods of soaking occur during the cycle.	50 minutes

c. After the cycle is complete, the DOCKING COMPLETE screen will appear on the control panel display (Figure 43). Push the button next to the OK icon to detach the rover from the docker. Pull the rover away from the docker.

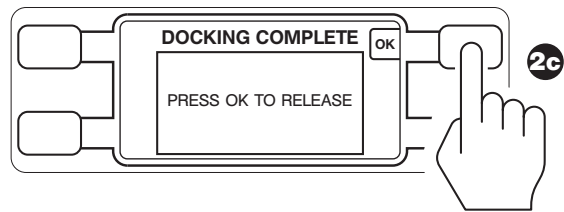


Figure 43 Docking Complete Screen

- NOTE:** Liquid prefill will remain inside each canister after a cycle is complete. Prefill contains a specified amount of detergent for initiating the break down of fluid waste collected during the rover's next use.
- Visually inspect the canisters for any remaining soil. If soil remains, an EXTENDED WASH cycle is available to provide a more thorough cleaning of the canisters.
- NOTE:** If this is the initial docking of the rover, make sure the rover is tested before use. See the *To Test the Rover* section.

# Inspection and Maintenance



## WARNINGS:

- Upon initial receipt and before each use, inspect each component for damage. DO NOT use any equipment if damage is apparent or the inspection criteria are not met.
- DO NOT disassemble, modify, service, or repair any system component or accessory, unless otherwise specified. Call Stryker Neptune Customer Service. See the *Contact Information* section.

## NOTES:

- Only individuals trained and experienced in the maintenance of reusable medical devices should install, inspect, and test this equipment.
- For service, contact your Stryker sales representative or call Stryker Neptune Customer Service. See the *Contact Information* section. Outside the US, contact your nearest Stryker subsidiary.
- Maintenance documentation for this equipment is available upon request to Stryker-authorized service personnel only.

INTERVAL	INSPECTION CRITERIA	ACTION
Before initial use	Check equipment for damage or missing components and for proper operation.	If damage is apparent, replace the equipment.
	Make sure the rover and docker operate as a system properly.	See the following sections: <i>To Dock the Rover</i> , <i>To Test the Rover</i> , and <i>To Adjust the Rover Settings</i> .
Before each use and after each cleaning	Check equipment for damage or missing components.	If damage is apparent, replace the equipment.
	Check for cleaning induced damage or unacceptable deterioration on all external surfaces of the rover, such as corrosion, discoloration, pitting, or cracked materials.	
	Check the canister(s), smoke evacuator filter cover, and infrared communication window for cracks or damage.	

INTERVAL	INSPECTION CRITERIA	ACTION
Before each use and after each cleaning	Check the two casters with locks and make sure the locks function properly.	If damage is apparent, replace the equipment. See the <i>Accessories</i> section.
	Check the power cord for cuts and the power cord plug for bent pins.	
	Check the power cord receptacle for bent pins or bent contacts.	
	Check the infrared communication window for any dirt or debris.	Thoroughly wipe away any dirt or debris on the infrared communication window. See the <i>Cleaning</i> section.
Six months	Check the replacement date on the fluid suction filter label. The fluid suction filter life is 500 hours.	Replace the fluid suction filter every six months or as indicated on the control panel display. See the <i>Accessories</i> section and the <i>instructions for use</i> supplied with the filter.
	Check the replacement date on the smoke evacuator filter label. The smoke evacuator filter life is 80 hours.	Replace the smoke evacuator filter every six months or as indicated on the control panel display. See the <i>Accessories</i> section and the <i>instructions for use</i> supplied with the filter.

**NOTE:** If any component must be discarded, see the *Disposal/Recycle* section.

## Cleaning



**WARNING:** ALWAYS clean the equipment as indicated upon initial receipt and before each use. Failure to comply may cause infection and result in patient or healthcare staff injury.

### CAUTIONS:

- DO NOT immerse any system component in liquid. DO NOT allow liquids or moisture to enter any electrical connection.
- DO NOT sterilize any system component.
- DO NOT use solvents, lubricants, or other chemicals, including glutaraldehyde or similar chemical cleaners, unless otherwise specified.
- Use of unapproved disinfectants may cause system damage.

## Recommended Equipment

- PPE as recommended by the disinfectant supplier (minimum: gown, gloves, face/eye shield)
- Soft, lint-free cloth
- United States Environmental Protection Agency (US EPA) registered disinfectant with a claim for activity against Hepatitis B. The following disinfectants have been validated for use on the exterior of the Stryker Neptune 2 Waste Management System:

Sodium Hypochlorite Based - Clorox® Clean-Up® Disinfectant Cleaner with Bleach (EPA Reg. #67619-17)

Quaternary Ammonium Based - CaviCide® (EPA Reg. #46781-6)

## To Wipe Down the Rover

- Wipe the external surfaces of the rover with a soft, lint-free cloth moistened with a non-abrasive, hospital disinfectant prepared according to the manufacturer's instructions. Clean surfaces until all visible soil is removed.
- Wipe critical areas such as the handle, control panel, manifold ports, and any other areas that may have become soiled, including the infrared communication window (Figure 44).

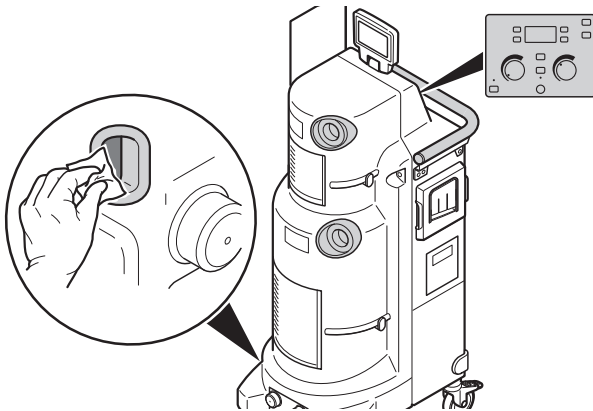


Figure 44 To Wipe Down the Rover

- Using a clean cloth moistened with disinfectant, wipe all surfaces. Make sure all surfaces remain visibly wet at room temperature for at least the minimum time specified in the instructions supplied by the disinfectant manufacturer.
- Remove any excess disinfectant solution using a soft, lint-free cloth moistened with water if required by the instructions supplied by the disinfectant manufacturer.
- Inspect the rover. See the *Inspection and Maintenance* section.
- If the rover will be used again, use the rover handle to push and relocate the rover. See the *To Setup the Rover* section. If the rover will no longer be used, use the rover handle to push and relocate the rover to a storage area.

## Storage and Handling

### CAUTIONS:

- ALWAYS store and transport the equipment within the specified environmental condition values throughout its useful life. See the *Specifications* section.
- ALWAYS call Stryker Neptune Customer Service before transporting or storing this equipment in freezing conditions. See the *Contact Information* section. Failure to comply will cause the expansion of frozen internal fluid to damage the equipment.

To ensure the longevity, performance and safety of this equipment, use of the original packaging material is recommended when storing or transporting this equipment.

## Disposal/Recycle



### WARNINGS:

#### BLOODBORNE PATHOGEN AND CONTAMINATION HAZARDS

- ALWAYS follow local regulations for safe handling, recycling, and disposal of biohazardous fluid waste and Neptune equipment.
- Call Neptune Customer Service for rover decontamination procedures. See the *Contact Information* section.

Failure to comply may cause environmental contamination or infection and result in personal injury.

# Troubleshooting

## Rover Operation

**NOTE:** For service, contact your Stryker sales representative or call Stryker Neptune Customer Service. See the *Contact Information* section. Outside the US, contact your nearest Stryker subsidiary.

PROBLEM	CAUSE	SOLUTION
The rover does not power up and the power switch is in the ON position.	Power cord is not connected or is not connected securely.	Connect the power cord or make sure the power cord is connected securely.
	Facility power is not available or OFF.	Make sure facility power is provided to the hospital-grade facility power receptacle.
No vacuum pump action after the SUCTION button is pushed.	Canisters are full and an error occurs.	Dock the rover.
	Solid or liquid material has entered the vacuum pump.	Remove the rover from use. Contact Stryker Neptune Customer Service. See the <i>Contact Information</i> section.
	An internal fuse is blown.	Remove the rover from use. Contact Stryker Neptune Customer Service. See the <i>Contact Information</i> section.
The rover's fluid suction is weak or insufficient.	Manifold is not installed correctly.	Rotate the manifold to make sure it is locked in place.
	Unused manifold ports are open.	Close all unused manifold ports of each canister.
	Suction tubing connection is not secure.	Make sure all suction tubing connections are secure.
	Unused suction tubing is not clamped.	Clamp any suction tubing not in use.
	Suction tubing is blocked or damaged.	Clear or replace the suction tubing.
	Suction accessory is blocked or damaged.	Clear or replace the suction accessory.
	Suction tubing is too long or has a narrow diameter.	Use shorter length or larger diameter suction tubing.
	Manifold is damaged.	Replace the manifold. See the <i>Accessories</i> section and the <i>instructions for use</i> supplied with the manifold.
	The SUCTION LIMIT SETTING dials are adjusted too low.	Turn the SUCTION LIMIT SETTING dials to adjust suction.
	Canister is full or almost full.	Relocate the manifold to the other canister.
	The fluid suction filter requires replacement.	Replace the fluid suction filter. See the <i>Accessories</i> section and the <i>instructions for use</i> supplied with the filter.
	The vacuum pump or internal sensor is damaged.	Remove the rover from use. Contact Stryker Neptune Customer Service. See the <i>Contact Information</i> section.
The rover's suction capability is lost.	The vacuum pump is damaged.	Remove the rover from use. Contact Stryker Neptune Customer Service. See the <i>Contact Information</i> section.
	A serious error has occurred.	See the <i>Error Code Messages</i> section.
A filter error appears on the control panel display.	The fluid suction filter has exceeded its useful life.	Replace the fluid suction filter. See the <i>Accessories</i> section and the <i>instructions for use</i> supplied with the filter.
	The smoke evacuator filter has exceeded its useful life.	Replace the smoke evacuator filter. See the <i>Accessories</i> section and the <i>instructions for use</i> supplied with the filter.
The rover is releasing a strong odor.	The fluid suction filter has exceeded its useful life.	Replace the fluid suction filter. See the <i>Accessories</i> section and the <i>instructions for use</i> supplied with the filter.
	Docker does not dispense detergent during the cleaning cycle.	See the <i>Docking Station Operation</i> table in the <i>Troubleshooting</i> section and the <i>Error Code Messages</i> section.
	The canisters require special additional cleaning.	Remove the rover from use. Contact Stryker Neptune Customer Service. See the <i>Contact Information</i> section.



# Troubleshooting

PROBLEM	CAUSE	SOLUTION
The smoke evacuator fails to operate after activation (EVACUATE SMOKE button is pushed).	The smoke evacuator is damaged.	Remove the rover from use. Contact Stryker Neptune Customer Service. See the <i>Contact Information</i> section.
A smoke evacuator error appears on the control panel display.	The smoke evacuator filter is damaged.	Replace the smoke evacuator filter.
	The smoke evacuator filter is not installed.	Install the smoke evacuator filter. See the <i>instructions for use</i> supplied with filter.
	The smoke evacuator filter is installed incorrectly.	Install the smoke evacuator filter again. See the <i>instructions for use</i> supplied with filter.
	The smoke evacuator is damaged.	Remove the rover from use. Contact Stryker Neptune Customer Service. See the <i>Contact Information</i> section.
IV pole height cannot be adjusted to its maximum height.	IV pole is supporting too much weight.	Remove excessive weight from IV pole.
	A loaded IV pole motor is used frequently.	Wait ten minutes. Push the appropriate IV pole height adjust button.
	The IV pole is bent, kinked, or pinched.	Remove the rover from use. Contact Stryker Neptune Customer Service. See the <i>Contact Information</i> section.
Fluid does not drain from the 4-liter canister into the 20-liter canister after pushing the EMPTY 4L CANISTER button.	A fluid waste clog exists at the bottom of the 4-liter canister.	<ol style="list-style-type: none"> <li>1. Remove the rover from use.</li> <li>2. Close all used and unused manifold ports.</li> <li>3. Turn both SUCTION LIMIT SETTING dials to the maximum value.</li> <li>4. Push the SUCTION button.</li> <li>5. Push the EMPTY 4L CANISTER button. If the clog persists, contact Stryker Neptune Customer Service. See the <i>Contact Information</i> section.</li> </ol>
An error occurs during EMPTY 4L CANISTER procedure.	More than three EMPTY 4L CANISTER procedures have been attempted.	Dock the rover.
	The contents of the 4-liter canister cannot fit into the 20-liter canister.	Dock the rover.
	The rover was unable to prefill the 4-liter canister	Dock the rover. Contact Stryker Neptune Customer Service if the problem persists. See the <i>Contact Information</i> section.
Sporadic electrical interference is experienced.	Electrical noise is present.	Turn off all the electrical equipment not in use in the room.
		Relocate the electrical equipment to maximize the distance between the equipment. Increase spatial distance.
		Plug equipment into different outlets.



# Troubleshooting

## Docking Station Operation

**NOTE:** See the *Neptune 2 Docking Station Instructions For Use REF 0702-014-700* and the *Docking Station Instructional Poster REF 9100-001-179* for additional troubleshooting information.

PROBLEM	CAUSE	SOLUTION
The rover will not dock or an error has occurred during docking.	The docker power cord is not connected or is loosely connected.	Make sure the docker power cord is connected securely.
	The docker power switch is in the OFF position.	Make sure the power switch is in the ON position and illuminated. If power switch is OFF, push the power switch to the ON position. Wait 60 seconds. Dock the rover.
	The docker power switch is in the ON position, but not illuminated.	Make sure facility power is provided to the wall receptacle. If facility power is OFF, apply facility power to the docker. Wait 60 seconds. Dock the rover.
	Communication between the rover and docker is interrupted because the infrared communication window is either dirty or obstructed.	Remove the dirt or debris from the rover's infrared communication window. See the <i>Cleaning</i> section in the <i>instructions for use</i> supplied with the rover. Dock the rover. Remove any obstruction from the docker's infrared communication windows. Make sure there are no tubes, hoses, or towels covering the docker's infrared communication windows. Dock the rover.
	The docker is not receiving facility water.	Make sure the water inlet hose is connected correctly and the facility water supply valve is open. Dock the rover.
	The docker requires a power reset.	Remove power, then apply power to the docker. Wait 60 seconds. Dock the rover.
	If the problem persists, the docker may be damaged.	Contact Stryker Neptune Customer Service. See the <i>Contact Information</i> section.
Liquid prefill remains inside each rover canister after a cycle is complete.	The presence of prefill is normal. This water and detergent solution (prefill) initiates the breakdown of fluid waste collected during the rover's next use.	No action is required.
The docker does not dispense detergent during the cleaning cycle.	The bottle of detergent is empty.	Replace the bottle of the detergent. See the <i>Accessories</i> section.
	The end of the detergent inlet tube is not immersed in the detergent.	Make sure the detergent inlet tube is routed through the tube stiffener and the end of the tube reaches the bottom of the detergent bottle.
	The detergent inlet tube is not connected securely to the detergent inlet port of the docker.	Connect the detergent inlet tube to the detergent inlet port of the docker securely.
	If the problem persists, the docker may be damaged.	Contact Stryker Neptune Customer Service. See the <i>Contact Information</i> section.
The rover canisters are not clean after a cleaning cycle.	The temperature of the water supplied to the docker is not adjusted for optimal cleaning.	For optimal cleaning of the canisters, use a water temperature of 37.8 to 43.3 °C [100 to 110 °F]. See the <i>instructions for use</i> supplied with the docker.
	The bottle of detergent is empty.	Replace the bottle of the detergent. See the <i>Accessories</i> section and the <i>instructions for use</i> supplied with the detergent.
An error occurs while the rover is docked and the rover cannot be removed from the docker.	The fluid connectors prevent the removal of the rover from the docker.	Remove power, apply power to the docker. Wait 10 seconds. Pull the rover away from the docker. Wait 60 seconds. Dock the rover.
	If the problem persists, the fluid connectors may be damaged.	Contact Stryker Neptune Customer Service. See the <i>Contact Information</i> section.
The rover cannot be removed from docker.	The two rear casters are locked.	Make sure the two rear casters are unlocked. The casters do not need to be locked when the rover is docked. Pull the rover away from the docker.
	The operator failed to acknowledge the docking cycle is complete.	From the control panel, push the button next to the OK icon to detach the rover from the docker.

# Error Code Messages



## NOTES:

- Error code messages appear on the control panel display. From the control panel display, push the button next to the OK icon to view the action message. To gain access to error code message history, see the *To Adjust Rover Settings* section.
- For service, contact your Stryker sales representative or call Stryker Neptune Customer Service. See the *Contact Information* section. Outside the US, contact your nearest Stryker subsidiary.




CODE	MESSAGE	ACTION
0.X	SYSTEM ERROR	CALL SERVICE
1.X	MEMORY ERROR	CALL SERVICE
2.X	SYSTEM ERROR	CALL SERVICE
3.0	DOCKER COMM ERROR	REMOVE ROVER - CYCLE DOCKER POWER - WAIT 60 SECONDS - DOCK ROVER AGAIN
3.1	COUPLING ERROR	REMOVE ROVER - CYCLE DOCKER POWER - WAIT 60 SECONDS - DOCK ROVER AGAIN
3.2	COUPLING ERROR	CALL SERVICE
3.3	OFFLOAD ERROR	REMOVE MANIFOLDS FROM CANISTERS - DOCK ROVER AGAIN
3.4	OFFLOAD ERROR	CALL SERVICE
3.5	PREFILL ERROR	CHECK FACILITY WATER SUPPLY-DOCK ROVER AGAIN
3.6	PREFILL ERROR	CHECK FACILITY WATER SUPPLY-DOCK ROVER AGAIN
3.7	COUPLING ERROR	CALL SERVICE
3.9	COUPLING ERROR	CALL SERVICE
3.12	DOCK INCOMPLETE	DOCK ROVER AGAIN
3.13	DOCKER NOT READY	REMOVE ROVER - CYCLE DOCKER POWER - WAIT 60 SECONDS - DOCK ROVER AGAIN
4.0	LARGE CAN FULL	SMALL CANISTER VOLUME WILL NOT FIT IN LARGE - DOCK ROVER WHEN ABLE
4.1	VACUUM ERROR - SM	CALL SERVICE
4.2	EMPTY TANK ERROR	CALL SERVICE
4.3	EMPTY TANK ERROR	DOCK ROVER TO REMOVE DEBRIS FROM SMALL CANISTER
4.4	PREFILL ERROR	PREFILL TANK IS EMPTY - DOCK ROVER
4.5	PREFILL ERROR	PREFILL TANK IS EMPTY - DOCK ROVER
5.0	FILTER EXPIRED	REPLACE FLUID SUCTION HEPA FILTER
5.1	FILTER EXPIRED	REPLACE SMOKE FILTER
6.X	EMPTY TANK ERROR	CALL SERVICE


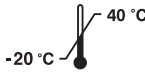

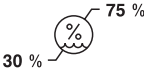
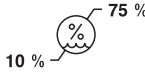

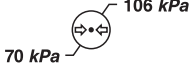

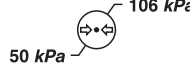
CODE	MESSAGE	ACTION
7.0	LEVEL SENSOR ERROR	CALL SERVICE
7.1	LEVEL SENSOR ERROR	CALL SERVICE
7.2	LEVEL SENSOR ERROR	CALL SERVICE
7.7	PREFILL ERROR	CHECK FACILITY WATER SUPPLY - DOCK ROVER AGAIN
7.8	PREFILL ERROR	CHECK FACILITY WATER SUPPLY - DOCK ROVER AGAIN
8.X	LEVEL SENSOR ERROR	CALL SERVICE
9.0	IV POLE ERROR	CALL SERVICE
9.1	IV POLE ERROR	REDUCE POLE LOAD WEIGHT
9.2	IV POLE ERROR	WAIT 10 MIN - RETRY POLE
10.0	SMOKE EVAC ERROR	CALL SERVICE
10.1	SMOKE EVAC ERROR	CALL SERVICE
10.2	NO SMOKE FILTER	SMOKE FILTER NOT DETECTED - REPLACE SMOKE FILTER
11.X	VOL DISPLAY ERROR	CALL SERVICE
12.X	LEVEL/TEMP SENSOR ERROR	CALL SERVICE
13.0	VACUUM ERROR - LG	CALL SERVICE
13.1	VACUUM ERROR - LG	CALL SERVICE
13.2	VACUUM ERROR - LG	CALL SERVICE
13.3	VACUUM ERROR - LG	CALL SERVICE
13.4	VACUUM ERROR - LG	CALL SERVICE
13.5	VACUUM ERROR - LG	CALL SERVICE
13.6	VACUUM ERROR - LG	CANISTER IS PRESSURIZED EXTERNALLY-TURN ON VACUUM SYSTEM
13.7	VACUUM ERROR - LG	CALL SERVICE
13.8	VACUUM ERROR - LG	CALL SERVICE
13.10	VACUUM ERROR - LG	CALL SERVICE
13.11	VACUUM ERROR - LG	CALL SERVICE
14.X	VACUUM ERROR - LG	CALL SERVICE
15.1	VACUUM ERROR - SM	CALL SERVICE
15.2	VACUUM ERROR - SM	CALL SERVICE
15.3	VACUUM ERROR - SM	CALL SERVICE
15.4	VACUUM ERROR - SM	CALL SERVICE
15.5	VACUUM ERROR - SM	CALL SERVICE
15.6	VACUUM ERROR - SM	CANISTER IS PRESSURIZED EXTERNALLY-TURN ON VACUUM SYSTEM
15.7	VACUUM ERROR - SM	CALL SERVICE
15.8	VACUUM ERROR - SM	CALL SERVICE
15.10	VACUUM ERROR - SM	CALL SERVICE
15.11	VACUUM ERROR - SM	CALL SERVICE
16.X	VACUUM ERROR - SM	CALL SERVICE


## Specifications

<b>Model:</b>	Neptune 2 Rover-ULTRA
<b>REF:</b>	0702-001-000
<b>Electrical Power Requirements:</b>	120 V $\sim$ , 60 Hz, 12.0 A, single phase 20 V $\equiv$ , 3 A during docking procedure; rover receives power from docker REF 0702-014-000
<b>Product Safety Certification:</b>	<div>  <b>CSA International</b>            C US  <b>Canadian Standards Association (CSA)</b>            CAN/CSA-C22.2 No. 60601-1:08, <i>Medical Electrical Equipment — Part 1: General Requirements for Basic Safety and Essential Performance</i>            CAN/CSA-C22.2 No. 601.1-M90, <i>Medical Electrical Equipment — Part 1: General Requirements for Safety</i>  <b>American National Standards Institute (ANSI)/Association for the Advancement of Medical Instrumentation (AAMI)</b>            ANSI/AAMI ES60601-1:2005, <i>Medical Electrical Equipment — Part 1: General Requirements for Basic Safety and Essential Performance</i>; Consolidated Reprint (2009); Amendment 2 (2010)  <b>Underwriters Laboratories (UL)</b>            UL 60601-1, <i>Medical Electrical Equipment, Part 1: General Requirements for Safety — First Edition</i>; Revisions through and including April 26, 2006  <b>International Electrotechnical Commission (IEC)</b>            IEC 60601-1:2005, <i>Medical Electrical Equipment — Part 1: General Requirements for Basic Safety and Essential Performance</i>; IEC Corrigendum 1 (2006); IEC Corrigendum 2 (2007)            IEC 60601-1:1988, <i>Medical Electrical Equipment — Part 1: General Requirements for Safety - Second Edition</i>; Amendment 1 (1991); Amendment 2 (1995); Corrigendum 1 (1995)         </div> <div>  <b>AS/NZS 4268: 2008</b>            N 17693         </div>
<b>Dimensions:</b>	<b>Width:</b> 48.3 cm [19 inch] <b>Height:</b> 259 cm [102 inch] with IV pole up; 177.8 cm [70 inch] with IV pole down <b>Depth:</b> 58.4 cm [23 inch]
<b>Mode of Operation:</b>	Continuous
<b>Adjustable Suction Limit:</b>	50 to 480 mm-Hg; measured with all ports closed
<b>Vacuum Measurement Accuracy:</b>	$\pm$ 5% of full scale ( $\pm$ 24 mm-Hg)
<b>Suction Limit Accuracy:</b>	< 24 mm-Hg or 10% of setting

# Specifications

<b>Mass:</b>	136 kg [300 lb] - collection empty 160 kg [353 lb] - collection full
<b>Volume:</b>	24-liter capacity (combination of 4-liter and 20-liter canisters)
<b>Volume Measurement:</b>	4-liter canister, $\pm 50$ mL 20-liter canister, $\pm 150$ mL <b>NOTE:</b> Volume measurements specified do not account for fluid evaporation or an inclined plane of operation that exceeds the specified range.
<b>IV Pole Capacity:</b>	12,000 mL or 3000 mL per IV pole hook; for example four three-liter (3000 mL) IV bags
<b>Inclined Plane of Operation:</b>	$\pm 2.5$ degrees
<b>Equipment Type:</b>	 Type CF Applied Part
<b>Equipment Classification:</b>	Class I Medical Electrical (ME) Equipment
<b>Ingress Protection (IP):</b>	IPX0
<b>Light Emitting Diode (LED) Classification (infrared communication windows):</b>	 <b>WARNING: INVISIBLE LED RADIATION</b> DO NOT VIEW DIRECTLY WITH OPTICAL INSTRUMENTS CLASS 1M LED PRODUCT — Viewing the laser output with certain optical instruments (for example, eye loupes, magnifiers and microscopes) within a distance of 100 mm may pose an eye hazard.
<b>Ground Type:</b>	 Protective Earth (ground); when connected to facility power


Environmental Conditions:	Operation	Storage and Transportation (before initial use)	Storage and Transportation (after initial use)
<b>Temperature Limitation:</b>			
<b>Humidity Limitation:</b>			
<b>Atmospheric Pressure Limitation:</b>			

Guidance and manufacturer's declaration - electromagnetic emissions		
The Neptune 2 ULTRA Rover REF 0702-001-000 is intended for use in the electromagnetic environment specified below. The customer or the user of the Neptune 2 ULTRA Rover REF 0702-001-000 should assure that it is used in such an environment.		
Emissions test	Compliance	Electromagnetic environment - guidance
RF emissions CISPR 11	Group 1	The Neptune 2 ULTRA Rover REF 0702-001-000 uses RF energy only for its internal function. Therefore, its RF emissions are very low and are not likely to cause any interference in nearby electronic equipment.
RF emissions CISPR 11	Class A	The Neptune 2 ULTRA Rover REF 0702-001-000 is suitable for use in all establishments other than domestic, and may be used in domestic establishments and those directly connected to the public low-voltage power supply network that supplies buildings used for domestic purposes, provided the following warning is heeded:
Harmonic emissions IEC 61000-3-2	Class A	
Voltage fluctuations/flicker emissions IEC 61000-3-3	Complies	 <b>WARNING:</b> This equipment/system is intended for use by healthcare professionals only. This equipment/system may cause radio interference or may disrupt the operation of nearby equipment. It may be necessary to take mitigation measures, such as reorienting or relocating the Neptune 2 ULTRA Rover REF 0702-001-000 or shielding the location.

# Specifications

Guidance and manufacturer's declaration - electromagnetic immunity			
The Neptune 2 ULTRA Rover REF 0702-001-000 is intended for use in the electromagnetic environment specified below. The customer or the user of the Neptune 2 ULTRA Rover REF 0702-001-000 should assure that it is used in such an environment.			
Immunity test	IEC 60601 test level	Compliance level	Electromagnetic environment - guidance
Electrostatic discharge (ESD) IEC 61000-4-2	± 6 kV contact ± 8 kV air	± 6 kV contact ± 8 kV air	Floors should be wood, concrete or ceramic tile. If floors are covered with synthetic material, the relative humidity should be at least 30%.
Electrical fast transient/burst IEC 61000-4-4	± 2 kV for power supply lines ± 1 kV for input/output lines	± 2 kV for power supply lines ± 1 kV for input/output lines	Mains power quality should be that of a typical commercial or hospital environment.
Surge IEC 61000-4-5	± 1 kV line(s) to line(s) ± 2 kV line(s) to earth	± 1 kV line(s) to line(s) ± 2 kV line(s) to earth	Mains power quality should be that of a typical commercial or hospital environment.
Voltage dips, short interruptions and voltage variations on power supply input lines IEC 61000-4-11	$<5\% U_T$ (>95% dip in $U_T$ ) for 0.5 cycle  $40\% U_T$ (60% dip in $U_T$ ) for 5 cycles  $70\% U_T$ (30% dip in $U_T$ ) for 25 cycles  $<5\% U_T$ (>95% dip in $U_T$ ) for 5 s	$<5\% U_T$ (>95% dip in $U_T$ ) for 0.5 cycle  $40\% U_T$ (60% dip in $U_T$ ) for 5 cycles  $70\% U_T$ (30% dip in $U_T$ ) for 25 cycles  $<5\% U_T$ (>95% dip in $U_T$ ) for 5 s	Mains power quality should be that of a typical commercial or hospital environment. If the user of the Neptune 2 ULTRA Rover REF 0702-001-000 requires continued operation during power mains interruptions, it is recommended that the Neptune 2 ULTRA Rover REF 0702-001-000 be powered from an uninterruptible power supply or a battery.
Power frequency (50/60 Hz) magnetic field IEC 61000-4-8	3 A/m	3 A/m	Power frequency magnetic fields should be at levels characteristics of a typical location in a typical commercial or hospital environment.
NOTE: $U_T$ is the a.c. mains voltage prior to application of the test level.			

# Specifications

Guidance and manufacturer's declaration - electromagnetic immunity			
The Neptune 2 ULTRA Rover REF 0702-001-000 is intended for use in the electromagnetic environment specified below. The customer or the user of the Neptune 2 ULTRA Rover REF 0702-001-000 should assure that it is used in such an environment.			
Immunity test	IEC 60601 test level	Compliance level	Electromagnetic environment - guidance
Conducted RF IEC 61000-4-6	3 Vrms 150 kHz to 80 MHz	3 V	<p>Portable and mobile RF communications equipment should be used no closer to any part of the Neptune 2 ULTRA Rover REF 0702-001-000, including cables, than the recommended separation distance calculated from the equation applicable to the frequency of the transmitter.</p> <p>Recommended separation distance</p> $d=1.2\sqrt{P}$ <p>150 kHz to 80 MHz</p> $d=1.2\sqrt{P}$ <p>80 MHz to 800 MHz</p> $d=2.3\sqrt{P}$ <p>800 MHz to 2.5 GHz</p> <p>where <math>P</math> is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer and <math>d</math> is the recommended separation distance in metres (m).</p> <p>Field strengths from fixed RF transmitters, as determined by an electromagnetic site survey<sup>a</sup> should be less than the compliance level in each frequency range<sup>b</sup>.</p> <p>Interference may occur in the vicinity of equipment marked with the following symbol:</p>  <p>(Non-ionizing electromagnetic radiation)</p>
NOTE 1: At 80 MHz and 800 MHz the higher frequency range applies.			
NOTE 2: These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people.			
<sup>a</sup> Field strengths from fixed transmitters, such as base stations for radio (cellular/cordless) telephones and land mobile radios, amateur radio, AM and FM radio broadcast and TV broadcast cannot be predicted theoretically with accuracy. To assess the electromagnetic environment due to fixed RF transmitters, an electromagnetic site survey should be considered. If the measured field strength in the location in which the Neptune 2 ULTRA Rover REF 0702-001-000 is used exceeds the applicable RF compliance level above, the Neptune 2 ULTRA Rover REF 0702-001-000 should be observed to verify normal operation. If abnormal performance is observed, additional measures may be necessary, such as re-orienting or relocating the Neptune 2 ULTRA Rover REF 0702-001-000.			
<sup>b</sup> Over the frequency range 150 kHz to 80 MHz, field strengths should be less than 3 V/m.			

# Specifications

Recommended separation distances between portable and mobile RF communications equipment and the Neptune 2 ULTRA Rover REF 0702-001-000			
The Neptune 2 ULTRA Rover REF 0702-001-000 is intended for use in an electromagnetic environment in which radiated RF disturbances are controlled. The customer or the user of the Neptune 2 ULTRA Rover REF 0702-001-000 can help prevent electromagnetic interference by maintaining a minimum distance between portable and mobile RF communications equipment (transmitters) and the Neptune 2 ULTRA Rover REF 0702-001-000 as recommended below, according to the maximum output power of the communications equipment.			
Rated maximum output power of transmitter  W	Separation distance according to frequency of transmitter  m		
	150 kHz to 80 MHz $d=1.2\sqrt{P}$	80 MHz to 800 MHz $d=1.2\sqrt{P}$	800 MHz to 2.5 GHz $d=2.3\sqrt{P}$
0.01	0.12	0.12	0.23
0.1	0.38	0.38	0.73
1	1.2	1.2	2.3
10	3.8	3.8	7.3
100	12	12	23
For transmitters rated at a maximum output power not listed above, the recommended separation distance $d$ in meters (m) can be estimated using the equation applicable to the frequency of the transmitter, where $P$ is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer.			
NOTE 1: At 80 MHz and 800 MHz, the separation distance for the higher frequency range applies.			
NOTE 2: These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people.			

# Appendix

## To Use Auxiliary Suction Ports (optional)

The auxiliary suction ports allow connection to a hospital wall suction regulator if an alternate suction source is required.



### WARNINGS:

- The rover **CANNOT** regulate hospital wall suction and **CANNOT** display suction levels above 570 mm-Hg. **ALWAYS** use a hospital wall suction regulator to control and monitor suction levels when using the auxiliary suction ports. Failure to comply could result in serious injury or death.
- **ALWAYS** make sure rover power is **ON** when collecting fluid waste. The rover can only detect full canisters if the rover is **ON**. If the rover is **OFF**, biohazard waste leakage or loss of suction can occur.

### NOTES:

- The rover is equipped with two auxiliary suction ports for each canister. Connecting both auxiliary ports of a canister to the hospital wall suction regulator will increase airflow and improve suction performance compared to connecting only one auxiliary port of a canister.
- If the ports are used, electrical power must be applied to the rover. The rover will not regulate the vacuum levels but will display vacuum and volume values and provide an audible indication if the canister fluid levels exceed their pre-defined limits.
- **ALWAYS** make sure the **SUCTION** indicator is **OFF** (not illuminated). If illuminated, push the **SUCTION** button to turn the indicator **OFF**.
- Applying maximum suction levels up to 760 mm-Hg will not damage the rover.

1. Verify the rover is connected to facility power and push the power switch to the **ON** position (Figure 45).

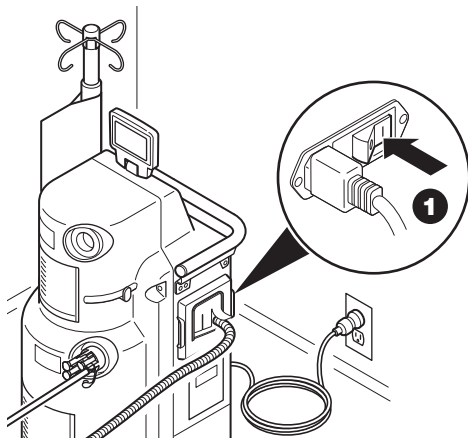


Figure 45 To Connect Power

2. Read the **WARNING** message on the control panel display, then push the control panel display button next to **OK** to access the **CONTROL** screen (Figure 46).

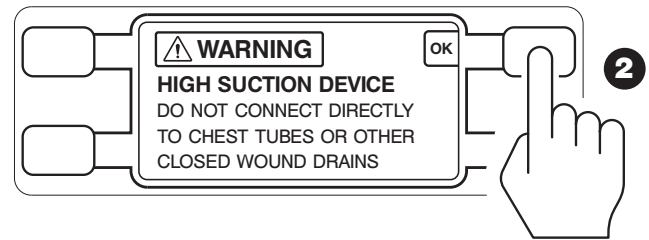


Figure 46 High Suction Device Warning

3. Attach suction tubing between the hospital wall suction regulator and the auxiliary suction ports on the rover (Figure 47).
4. Apply and regulate the suction level provided to the rover from the hospital wall suction regulator.

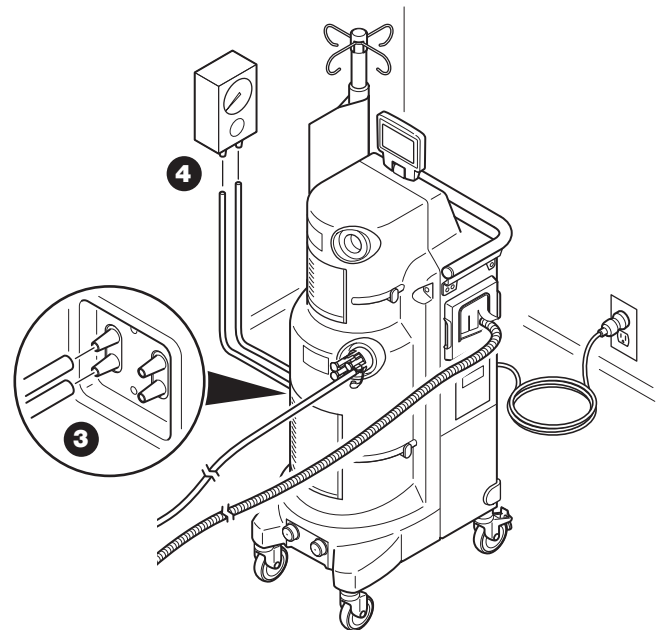


Figure 47 To Connect Auxiliary Suction Ports





**Stryker Instruments**  
4100 E. Milham  
Kalamazoo, Michigan  
(USA) 49001  
1-269-323-7700  
1-800-253-3210

**stryker®**

# Signature History Report

Version	Signature	Role	Event Date	Vote
S	Thompson Kristen	CA_Owner	2016-02-10 15:07:31 EST	Continue
S	Petyko, Holly (Contractor)	Editor	2016-02-12 09:58:10 EST	Continue
S	Thompson Kristen	CA_Owner	2016-02-12 10:23:28 EST	Continue
S	Nollar, Andrew	CA_Marketing Manager	2016-02-12 10:25:01 EST	Approve
S	Thompson Kristen	CA_Clinical Sciences	2016-02-12 10:30:05 EST	Approve
S	Wiersema, Kim	CA_Regulatory Affairs	2016-02-12 11:46:24 EST	Approve
S	Boyer, Rick	CA_Product Design Engineer	2016-02-12 15:10:43 EST	Approve
S	Joseph, Kaylee	CA_Quality Engineer	2016-02-18 09:04:43 EST	Approve
S	Pasos, Roberto	CA_Product Safety	2016-02-26 14:10:00 EST	Approve
S	Pulliam Sylvia	Document Control	2016-02-26 14:50:41 EST	Complete
S	Petyko, Holly (Contractor)	Editor	2016-03-04 09:44:35 EST	Continue
S	Thompson Kristen	CA_Owner	2016-03-04 09:46:04 EST	Approve

NOTE: IF THIS REPORT IS BLANK, PLEASE SEE WINDCHILL ECN FOR SIGNATURES.

## Related Information

CR Number	CR0287180
CR Class	DMR-Commercially Released
Originating Entity	INST: Kalamazoo
Origin	Nonconformance(NC)
Initial CR Approval Date	02/05/2016 09:55:35
CN Number	CN140265
CA Number	CA163545
NPD Disposition Plan	N/A